From the Editorial Board

Welcome to the thirteenth volume of the *International Journal of Process Education* in which we present a collection of Process Educator's collaborative research efforts. Within this volume we explore the psychological perspectives and functions within Process Education, are introduced to new methodologies, and develop a deeper understanding of the roles of coaching and performance mentoring.

An examination of the psychological perspectives behind Process Education is the focus of our first paper, **Nine Psychology Perspectives for Process Educators**. These psychological perspectives provide additional insights for identifying performance and growth opportunities. Additionally, these perspectives supply guidance for recognizing important characteristics of experiences and coherently aligning responses to them through reflective exploration of personal needs, values, mindsets, and aspirational ideals.

Our next two papers examine the roles of mentor and coach. Batchelor, Apple, Van Slyke, Leise, and Ellis compare and contrast the mentor and coach role in **Roles of Performance Mentoring and Self-Growth Coaching in Developing Human Capability**. The characteristics of mentoring and coaching are differentiated, and the integration of these roles is depicted. Process Education resources and strategies for best practices are presented for practitioners. The second of these two papers focuses on academic coaching. Leasure, Beyerlein, Forney, Gunther, and Patch discuss their creative synthesis of the research-based practices of educational coaching, Process Education concepts, and the seven principles of learning and persistence into a coaching method with the acronym ROCK-SOLID that includes nine essential steps in **Lessons from a Large Scale Implementation of Academic Coaching**.

Two new methodologies are the focus of our next two papers. In the first, **Developing Transferrable Knowledge Using the Methodology for Generalizing Knowledge,** Utschig, Apple, Ellis, and Leasure introduce the Methodology for Generalizing Knowledge as a process of turning it into working expertise which can then be transferred to new contexts. In the second paper, **An Insight Methodology to Guide Creation and Validation of Discoveries**, Leise, Dombi, and Apple discuss the Insight Methodology. While laying the context of types of insights, they introduce a seven-step process that guides the user to take an observation, use specific criteria at each of the seven steps, and convert it into a "tip" or guiding concept for future application.

Our final paper for this volume is the **Evolution of Six Functions in the History of the Process Education Framework**. In this work, Leise, Apple, Ellis and Beyerlein discuss the primary educational functions of knowing, learning, and learning to learn to include emphasis on the functions of self-regulation of performance, which is a key to the function of growth, and on the self-determination of life decisions as the essential characteristic of the function of self-growth. The enriched understanding of growth and self-growth as organizing constructs for the PE framework presents individuals, especially professionals, with new observations and insights about conceptualizing assessment and utilizing reflection to enhance quality of life along one's life journey.

It is our hope that you will enjoy reading the contributions to our newest issue as much as we enjoyed working with the authors to bring the research to fruition. We look forward to receiving your feedback as well as your future research contributions.

Sincerely,

Kathleen Burke

Chief Editor, *International Journal of Process Education*

Nine Psychology Perspectives for Process Educators

Cy Leise [1], Dan Apple [2], Wade Ellis [3], Steve Beyerlein [4]

Abstract

The Process Education (PE) Framework includes many resources for enhancing the quality of growth from opportunities that become available or are self-determined for strategic purposes. The nine psychological perspectives described in this paper provide additional insights for identifying performance and growth opportunities with potential to improve quality of life (QoL). These perspectives provide guidance for recognizing important characteristics of experiences and coherently aligning responses to them with the demands of these experiences by expanding the basis for reflective exploration of personal needs, values, mindsets, and aspirational ideals. While strengthening learning skills relevant to attainment of learning, performance, and growth competencies is the basis for positive and enduring outcomes from life experiences, increased consciousness about psychological factors can transform the perception and meaning of personal and professional experiences in all contexts.

Introduction

The Process Education (PE) framework has been developed as a system of educational interventions that address many of the barriers that frustrate professional satisfaction and restrict the quality of outcomes. Since Bloom's taxonomy of cognitive educational objectives (1956), it has been clear that learning occurs at multiple levels and must be consciously explored by engaged students (Bobrowski, 2007). Process educators have worked to create a framework (Apple et al., 2016) based on constructivist principles (Wheatley, 1991; Nola & Irzik, 2005) that has produced many new tools (e.g., rubrics, design models, and methodologies) that are supported by foundational resources such as the Classification of Learning Skills (hereafter "2019 CLS"; Leise et al., 2019). The 2019 CLS does not stand alone; Soto et al. (2015) reference other educational frameworks active in the learning skills approach.

As the PE framework has been developed, the buildup of resources and methods has resulted in innovative insights about the focus of theoretical attention. An important development, discovered from years of exploration of the learning process is the current emphasis on growth and self-growth as constructs that best characterize PE. Spady (2021) and Brophy (2015) call for movement from a knowledge transmission mindset to one that attends to the needs of whole individuals in dealing with the complexities of life. The differentiation of self-growth from growth (Dweck, 2017) is important for the aims of the PE framework and is an innovation that opens the way for the addition of psychological knowledge that will deepen the insights of practitioners as they deal with learners who need better strategies not only for their educational preparation but for life itself (Apple et al., 2018).

Everyone feels pressure from the challenges of living in an increasingly complex society (Lindsey, 2013) in which old ways and choices have been superseded by unexpected experiences such as the COVID-19 pandemic. These challenges put pressure on everyone, especially educators, to adapt and change in creative ways just to maintain personal, family, and community well-being and status. This historical moment will likely be best remembered for those who met this challenge by valuing new mindsets that guided them in innovative directions in their life journeys by turning perceived constraints into opportunities for growth consistent with their aspirations and ideals, as well as those of others around them.

The PE Framework

Process Education (PE) is an educational framework focused on six process functions that can be consciously actualized (Leise, 2022). At the top of this hierarchy is self-growth (Jain et al., 2020), the conscious integration of insights from the other five levels, i.e., knowing, learning, learning to learn, performing, and growing. The six PE functions represent ways that can lead to unlimited, positive capabilities. This word choice is deliberate. Capabilities are not capacities that are fixed or limiting (Nussbaum, 2011; Robeyns & Fibieger Byskov, 2021). Self-Growth plays a special role in the PE framework because it requires action choices with much greater impact on QoL and the trajectory of life journeys (Apple et al., 2021). Growth capability-makes it possible to improve each life domain in ways that can lead to ever increasing life quality (Hurd et al., 2021). Individuals who attain self-growth capability demonstrate the self-determination, enhanced self-regulation, and expansion of growth capabilities to optimize their ideal selves (Rogers, 1961). In other words, they

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have greater control of their life journeys (Baxter Magolda, 2009; Landau et al., 2014; Lilgendahl & McAdams, 2011; Szu-Chi & Aaker 2019).

Identity factors such as self-concept, personality, attitudes, and motivation can be significant resources for growth if one consciously recognizes how to match these personal characteristics to valued growth opportunities and, equally importantly, how to avoid entrapment in one's limiting characteristics. Accurate self-knowledge and self-monitoring help with self-regulation of identity factors, including motivation (Kaplan & Flum, 2015), that are useful for responding to present opportunities. Self-knowledge is needed for setting criteria related to conscious selection and self-determination of opportunities that are likely to be a good fit for growth aspirations congruent with conceptualization of one's ideal self. Hurd et al. (2021) propose a model that includes four elements to define both real and ideal self. Self-concept is the central and holistic sense of identity that forms and changes over time and from experiences and can be imagined into the future. A person's accumulation of knowledge about self, others, and the world provides a basis for understanding what is objective compared to the subjectivity of a purely personal viewpoint. Memorable individual experiences, failures, and accomplishments highlight features of self-concept and identity that are likely to be growth areas and a basis for self-determination of a future ideal self. Finally, the capabilities acquired through growth in a wide array of learning skills empower performers to improve their performances that add to memorable experiences and direct attention to future growth potential.

As one makes decisions about how to respond to life's opportunities, desired outcomes include increased happiness, meaning, and psychological enrichment. Insights are likely to occur if one consciously assesses each opportunity (Apple et al., 2016) for how and why each of the six function could be important for strategic self-determining and self-regulating responses (Ryan & Deci, 2017). Growth and self-growth opportunities are numerous in daily life, but many are missed because of limitations such as cognitive attention, conditioned reactions, and fixed mindsets (Dweck, 2017). Optimal self-regulation of one's capabilities depends, in part, on awareness of the psychological factors that influence plans, decisions, and actions. The nine psychological perspectives were selected to provide multiple ways to conceptualize personal traits, situational perceptions, and motivational influencers valuable to incorporate into assessment and reflection work.

Introduction of Nine Psychological Perspectives

The instigation for identification and description of the nine psychological perspectives presented in this paper resulted from the evolution of PE scholarship and practice focused on growth and self-growth. The earlier emphasis of the PE framework was on development of the functions of knowing, learning, learning to learn, and performing (Apple et al., 2016). Growth and self-growth functions give prominence to psychological factors such as attitudes, traits, and motivation. Many of the dimensions of growth (Hurd et al., 2021) have psychological aspects including self-awareness and setting life goals. Self-Growth is characterized by capabilities that empower self-determined quality of life (QoL) decisions that increase happiness (Seligman, 2018), deepen life's meaning, and lead to psychologically enriching experiences (Oishi et al., 2020).

Each of the nine perspectives provides a frame of reference for enlightenment about novel choices that can be self-determined and self-regulated depending upon the opportunities afforded by a situation or experience. Each of the perspectives captures only a component or feature of an experience but the meaning and operational context can produce insights for a range of strategies to increase personal and situational change. Increased understanding of the psychological factors highlighted in each perspective will provide any individual with a greater range of possibilities for metacognitive interpretation and dynamic adjustment of potential responses to the challenges of situations. Individual consciousness of psychological factors is influenced significantly by the interpersonal exchanges that are often the basis of the meaning and purpose of many experiences. Learning skills from all domains of the 2019 Classification of Learning Skills (Leise et al., 2019) become more robust if the range of influences on performance are consciously managed. As individuals increase their self-regulation of factors suggested by the psychological perspectives, their growth potential in learning, learning to learn, and performing broadens and deepens because these are the contexts in which sustainable competencies emerge for longer-range use in growth. Without this level of consciousness about what, why, and how things influence one's growth, it is not possible to fully achieve the competencies needed for self-growth.

The nine perspectives introduce many factors from the wealth of theory and research available in psychology. Each response by an individual is a result of some pattern of internal and external variables that interact in situations of varying challenge. The addition of interpersonal influences adds further complexities that trigger reactions within situations that reflect shadows from earlier development of trait and mindset patterns. These patterns result in conscious and unconscious action tendencies that are a mix of strengths and impediments that affect self-regulatory capabilities and strategies. The capability to independently determine one's decisions along life's journey

requires a high level of self-awareness, reflective attention to prediction of future challenges, realistic planning, and highly effective use of growth-related capabilities.

The relevance of each psychological perspective for PE is briefly described here.

1. *Self-discovery* is an essential quest to understand needs, values, and personal characteristics that holistically define who one is and who one wants to become.
2. *Independence/ownership* is associated with intrinsic motivation, the key to self-determination, and a key foundation for each of the six PE functions, especially self-growth.
3. *Initiative* requires self-regulation of motivational processes for making changes that lead to achievement of new aims.
4. *Reflection* is a process for making greater meaning from experiences and adding detail to enhance memories.
5. *Seeing the big picture* is important for making ethical and effective choices in the face of life's uncertainties by considering implications and consequences.
6. *Self-validating* is an ongoing balancing of internal and external sources of feedback to maintain a positive self-concept and ongoing progress towards one's ideal self.
7. *Maintaining perspective* requires ongoing assessment of what is important for self, accuracy in interpreting current influences on self, and putting current happenings into an historical perspective.
8. *Managing energy* is an individual challenge that requires awareness of influences that enhance energy, reduce it, and find ways to remove constraints on using or expanding it.
9. *Enhancing Quality of life* can be strengthened by developing growth and self-growth capabilities that support action plans that lead to desired personal or situational changes that enhance QoL.

The Role of Consciousness in Using Psychological Perspectives

The nine psychological perspectives address a wide array of knowledge but their value for practitioners depends upon growth in conscious self-regulation of factors that are relevant to successful management of each situation. Lonergan characterizes *consciousness* as a succession of cognitional acts such as imagining, understanding, formulating, reflecting, and judging that are very different from the unconscious bodily processes that sustain life and make perception possible (1957/1992). However, there is consciousness of the effects of automatic biological and perceptual processes (e.g., awareness of physical wellbeing and holistic perception of sensory information). Lonergan does not give preeminence to introspective or intuitive abilities as a direct source of knowing oneself but does argue that knowers can "self-affirm" their acts of knowing—which can then be a basis for consciously increasing self-knowledge.

Lonergan proposes three levels of consciousness (1957/1992). The first, empirical consciousness, is similar to sentience (Pinker, 1997); it involves sensations and perceptions that keep one oriented in the world of experiences. The second, intelligent awareness, focuses on the types of awareness and insights that occur during the learning process. The third, rational consciousness, is self-aware reflection on the data from the first two levels as well as on personal intentionality to inquire further to fulfill the desire to have valid knowledge in general. Lonergan's philosophical viewpoint, although meant as a general framework, is consistent with the emphasis of the PE framework on learning skills as a basis for conscious creation of increasingly complex capabilities that support the growth and self-growth levels. His philosophic theory is also consistent with psychological theories and evidence about the nature of consciousness (Bertolero & Bassett, 2019; Buzsáki, 2022; Carter, 2002; Csikszentmihalyi, 1990, 1993; Goupil & Kouider, 2019; Rosenfield, 1992).

An important aspect of consciousness is *mindsets*, which are complex beliefs (Leicester, 2016) often unconsciously held and unexplored, about issues such as personal agency (Bandura, 2001; Eccles, 2009), values (Kirschenbaum, 2013) accuracy of perceptions (Marcel, 1985), situational focus (Zelazo & Carlson, 2012), and readiness or disposition to act in ways consistent with one's identity (Dweck, 2017). Mindsets are important to consciousness because they allow attention to be focused quickly and with a feeling of assurance or conviction about how to respond to situations (Dweck & Yeager, 2019).

Self-monitoring of the attentional focus of one's consciousness is very challenging because consciousness is the continual connection of self with the dynamically changing world—including one's own mind and body. Lonergan proposes several layers of consciousness that are consistent with the multiple needs of daily life, the acquisition of new knowledge through learning, and reflective insights from self-awareness about psychological factors that are influencing responses (1957/1992). Several processes that can be self-regulated are helpful as strategic viewpoints for observing or inferring how a psychological factor is a help or a hindrance to performance success and for recognizing how one can rise beyond present and past levels of capability through

growth and self-growth. The following points of focus are exemplars for how the nine perspectives can add power to self-determination of decisions and self-regulation of performance and growth processes along one's life path.

1. **Locus of control** (Ajzen, 2002) has a range from entirely extrinsic to fully intrinsic. Independence and initiative depend upon intrinsically controlled self-regulation of situations and experiences to attain intended outcomes. Sharing of locus of control in collaborative or cooperative endeavors requires a higher level of consciousness that considers the value of multiple points of view plus awareness of factors such as the relative status of individuals in such contexts. Self-control and self-management skills are in evidence when locus of control is intrinsic.
2. **Cognitive attribution** (Forgas et al., 1990) is a label for the problem of how to validly recognize the causes or motives for one's own cognitive, social, and affective responses as well as those of others. There is a strong tendency to assume that personal behaviors are logically related to circumstances. If a truly collaborative team fails, one or more members may still blame the failure on a personality trait or other stable characteristic of others. The subjective nature of attributions about personal abilities and the rapidly changing patterns in interpersonal contexts make their control very challenging. Self-discovery insights occur when the attribution process is thoughtfully explored through reflection to support better self-regulation of introspective intuitions.
3. **Growth** cannot occur without choosing goal challenges that clearly are greater than one's past achievements (Locke and Latham, 2019). Self-regulating one's decision process to consciously focus on goals more valuable from a big picture perspective will optimize use of capabilities as well as mental and physical energy.
4. **Metacognitive processing** (Gutierrez de Blume, 2022) of one's responses and attributions during performances requires conscious self-regulation (Robinson et al., 2015) of all the layers of influence and affective concern that occur while still moving toward a desired outcome.
5. **Consciousness of the sources and conditions of one's motivation** is extremely important for growth and self-growth. Willpower has a valid role in maintaining short-term persistence with applying available skills but intrinsically motivating interest in taking advantage of valuable opportunities will make them more exciting to pursue (Ryan & Deci, 2017).
6. **Learning skills** from the 2019 CLS underlies all nine psychological perspectives. The possibilities within and across the perspectives can be enhanced by reflecting on performances to identify missing skills and predicting which learning skills must be developed for greater challenges in the future.

Nine Psychological Perspectives for Enhancement of the PE Framework

The nine perspectives apply to any developmental context, but specifically have potential to enrich the uses of PE methodologies, performance measures, and strategies. The aim is to exemplify psychological concepts and practices that learners, educators, mentors, self-growth coaches, and self-mentors can apply to enhance development of all PE functions, but with special emphasis on growth and self-growth that will increase QoL in diverse ways.

Orientation to the Psychological Perspectives

In the following sections, brief background overviews introduce each of the nine psychology perspectives to represent how psychology adds supporting concepts and practices for stakeholders working within the PE framework. Each of these nine viewpoints will be explored using the following subsections:

Definition: A brief description of the perspective

Supportive Growth and Mentoring Skills: A list of CLS 2019 skills closely aligned with each psychological perspective

Insight Quote: A succinct insight from an external author to stimulate creative thinking about the perspective

Historical Background: A brief overview of the kinds of psychological theories and philosophical concepts associated with the perspective

Journey Toward the Ideal Self: A rationale for the value of the perspective for developing personal meaning and enrichment of self-concept during the journey toward the ideal self

Psychological Models: Selection of two or three psychological theories or models that add valuable detail about psychological knowledge with potential to enhance consciousness of beliefs, mindsets, and practices for facilitating growth and self-growth

Growth and Self-Growth Insights: Conceptual insights are presented that individuals can use to elevate their understanding of how to use this perspective in their practice. The focus of the insights is at the highest PE function levels, i.e., growth and self-growth, to provide a challenging basis for reflection about the integration of all functions.

The terms in italics within the insights sections, for all nine perspectives, identify or paraphrase growth and mentoring learning skills associated with the perspective.

1: Self-Discovery *Exploring why one's development has resulted in thinking, behaving, and feeling the way one does*

Growth Skills: Being Self-Aware, Listening to Self, Introspecting, and Exposing Vulnerabilities

Mentoring Skills: Self-Evaluating, Being Self-Honest, Analyzing Needs, and Forecasting Needs

> "It is plausible that future-oriented thinking in deliberate mind-wandering [freely moving thought] is different from future-oriented thinking in non-deliberate mind-wandering; the first being possibly associated to planning, while the second one is a propensity to worry about potential outcomes. (Fossa et al., 2019)

Historical Background

Historians of psychology (Robinson, 1995; Graiver, 2019) recognize that ideas about self-knowledge and how it is attained are quite different depending on era and culture. Graver (2007) describes the ancient Stoic philosophers' concern about making sound ethical judgments despite potentially false beliefs associated with emotional reactions to experiences. Olney (1998) describes St. Augustine's theological interpretation of his introspections about personal memories in his *Confessions* as a path to understanding his relationship with God. Strongly contrasting purposes in contemporary cultures include understanding the individual in terms of character (e.g., Peterson and Seligman, 2004; Huynh et al., 2017) and potential for self-actualization (Maslow, 1971).

Journey Toward the Ideal Self

Self-discovery requires analysis of memories that results in understanding and insights about the influence of one's past developmental path on present ways of meeting needs, relating to others, pursuing goals, and being self-honest about values (Banaji & Greenwald, 2016). Desjarlais and Smith (2011) describe principles for the distinctive utilities of assessment and reflection for close examination of the growth potential of experiences. Self-discovery involves valuing and using a continuum of subjective experiences for understanding the dynamic nature of one's evolving identity, e.g., as described by William James (1890). Growth skills for this perspective such as Introspection and Listening to Self, involve conscious attention to internal representations of self and experiences (e.g., Fossa et al., 2019), which are essential sources of information about one's current self-concept and the basis for growth over time that is consistent with one's ideal self.

Psychological Models

Dweck addresses questions of how personality (e.g., McCrae & Mõttus, 2019) and other personal characteristics and response patterns emerge from how one has learned to meet psychological needs (2017). She proposes a succinct needs model with three "basic" needs that are present from infancy (*acceptance, predictability,* and *competence*) and four "emerging" needs: "*trust*" (a combination of acceptance and predictability), *control* (a combination of predictability and competence), *self-esteem/status* (a combination of competence and acceptance), and *self-coherence*, which is the "hub" of all the needs. Dweck also proposes a three-part model called "BEATs," (Beliefs, Emotions, Action Tendencies) to explain how need fulfillment motivates differentiated personality development (2017). BEATs occur frequently and are triggered as part of every experience. Because action tendencies, which can be thoughts or emotions, vary in terms of effectiveness, it is essential to consciously apply growth skills to take advantage of the potential that opportunities provide for furthering one's capabilities. An additional benefit is increased awareness of one's present self-concept and of predictions about ideal self.

Sometimes your body is smarter than you are" is a pithy observation by an unknown author that puts attention on *interoceptive* (internal) feedback as with from the heart and gastrointestinal tract. This neural feedback from within the body is designed to optimize body maintenance but is also now known to be a foundation for the sense of physical "self-awareness" which directly demonstrates the meaning of "I exist" and influences all responses, conscious and unconscious (e.g., Dunn et al., 2010; Atari et al., 2020).

Barrett et al. challenge the validity of traditional assumptions about emotions (2019). Barrett's core affect model explains how emotions are "constructed" from neural processes that use both external and internal information to prepare one to respond—before a specific response occurs (2017). Many kinds of emotional and behavioral responses are possible even in situations that typically trigger a certain emotion (e.g., anger is not the only way to manage a threatening provocation). Beilock describes examples based on research that illustrate how interoceptive feedback significantly influences decisions and other reactions (2015). The implication of this new area of neuropsychological research is that self-awareness is a complex challenge that requires openness to what can be learned about how to take charge of personal affective reactions in each situation or interaction.

Related Growth Insights

1. *Introspective awareness* of how development of personal characteristics has contributed to self-concept related to performances will strengthen strategies for growth of learning skills that can contribute to QoL.
2. *Listening to self*, especially by attending to interoceptive feedback, increases awareness of the powerful potential of self to become more efficacious when ready to face challenges in one's relationships and environments.
3. *Exposing vulnerabilities* requires willingness to hear multiple interpretations of behaviors, especially under conditions that make one sensitive to the reactions of others and to negative feelings about lack of current performance quality relative to expectations.

Related Self-Growth Insights

1. The self-growth mindset depends on awareness and *analysis of needs* (current and future) and *forecasting* how they can be met without either lessening self-expectations or increasing inhibitory influences and risks to growth.
2. *Self-evaluating* without strong self-assessment skills leads to being self-judgmental and produces risks such as overly attending to self-esteem rather than to potential strategies to build and broaden growth capabilities.
3. The development of a vision of one's ideal self requires *honesty* and valid perceptions about one's real-self, as embodied by one's current self-concept, so that the aspirations represented by an ideal-self are based upon a genuine vision—not a caricature of one's real-self.

2: Independence/Ownership *Producing quality from personally valued decisions and actions*

Growth Skills: Feeling Empowered, Believing in Your Potential, Committing to Self, Committing to Success, and Accepting Consequences

Mentoring Skills: Encouraging Ownership, Being Independent, Giving Consulting Feedback, Highlighting Substandard Performance, and Transforming Strategies

> "Yet, despite the fact that humans are liberally endowed with intrinsic motivational tendencies, the evidence is now clear that the maintenance and enhancement of this inherent propensity requires supportive conditions, as it can be fairly readily disrupted by various nonsupportive conditions. (Ryan & Deci, 2000)

Historical Background

Independence has been studied as an aspect of individual self-determination (Ryan & Deci, 2017). However, more recent perspectives, e.g., Kachanoff et al. (2019) include social identity needs that become psychologically associated with group membership as an influence on self-esteem and sense of "empowerment." A more comprehensive conceptualization is to integrate needs of relatedness, competence, and autonomy as defining characteristics of independence/ownership of one's decisions and actions.

Journey Toward the Ideal Self

Independence is a central characteristic of self-growth because it is defined by viewing goals from a personal agency perspective (Bandura, 2001). Autonomy and ownership of life decisions are essential for growth goals to become important in one's personal life vision. Self-Growth, by definition, requires ample independence and personal agency because one must be in charge of building personal growth capabilities. Feeling empowered motivates planning to strengthen performances in experience areas needed for life quality and role identity development.

Psychological Models

Self-determination theory (Ryan & Deci, 2017) is a deeply studied multidimensional theory of motivation that developed from the distinction between intrinsic and extrinsic motivation and the effects of each of these mindsets on performance and well-being outcomes. Intrinsic motivation refers to behaviors enacted for their own sake; being more autonomous is the most essential characteristic of self-growers and is supported by self-regulation capabilities. Individual motivation can become negatively "introjected" if needs for competence, autonomy, and relatedness have not been met in developmentally constructive ways earlier in life (Assor et al., 2009; Higgins, 1987). Extrinsic (instrumental) motivation may increase effort in useful directions or may lead to limited appraisal of choices for achieving one's dreams. Intrinsically motivated ownership of one's decisions and independence of action is a critical factor both for overcoming unconscious motives that sabotage opportunities for growth and also for increasing the likelihood of consciously seeking and engaging with experiences that have growth potential.

Motivation to Lead (MTL; Badura et al., 2019) is an example of a meta-motivational model that assumes that leaders feel empowered and independent for multiple reasons. Three motives have been studied by MTL researchers: affective-identity—the degree to which one enjoys leadership and sees oneself as a leader, social-normative—the degree to which one views the role as a responsibility and being noncalculative—viewing leadership positively despite costs and minimal personal benefits. Both Self-Determination Theory and Motivation to Lead assume that natural interests and capabilities can be strengthened by consciously setting growth goals and by following through with identity-changing decisions associated with self-growth in consequential roles such as being an effective leader. Educational psychologists (Nolan et al., 2015; Turner & Nolan, 2015), emphasize the importance of recognizing the situative nature of motivation (i.e., it occurs as part of specific experiences rather than as a general factor).

Strategies for consciously increasing independence/ownership start with assessing action planning, whether formal or informal, to discover how well plans lead to goals. Assessing how closely one's productivity is based in intrinsic motivation (Ryan & Deci, 2017) expands self-knowledge and the learning needed for increasing ownership of one's actions. Learning to learn about independence and ownership involves maintaining and self-regulating one's sense of agency (Bandura, 2001) to increase productivity in diverse performance contexts. Greater insightfulness about empowerment factors increases the likelihood that commitment to success will be connected with a sense of responsibility for the well-being of others while meeting personal needs consistently with one's values. As belief in personal potential increases, growth capability development is more likely to include trust in capability to mentor others. Self-determined aims become more intersubjective and compassionate as one gains in self-mentoring capabilities that include being open to self-growth coaching when unsure how to proceed.

Related Growth Insights

1. Despite the many personal, social, and cultural influences that make independence of decisions and actions difficult, *committing to self* makes it possible to own decisions that allow shifting from a constrained "ought self" to *feeling empowered* to seek a psychologically richer life.
2. An expanding sense of independence requires a *belief in personal potential* and an increase in willingness to *accept consequences*.
3. *Committing to success* with specific goals beyond one's present talents and strengths requires one to develop one's own capabilities to address existing barriers to success, future QoL, and identity development.

Related Self-Growth Insights

1. *Encouraging ownership*, as a teacher, parent, mentor, or facilitator, is critical when helping individuals take greater responsibility for reliably creating growth opportunities.
2. Self-Growth coaches provide *consulting feedback* to clients by addressing their unique dilemmas, especially when they are stuck, by creating new *transformative strategies* that will be contextually effective.
3. For more effective growth plans, it is necessary to admit when one's *performances are substandard* and to seek *consulting support* to develop effective ways to produce desired changes in personal behaviors.

3: Initiative *Why and how one goes about starting to do something new*

Growth Skills: Motivating Self, Being Proactive, Changing Reactions, Changing Behaviors, and Self-Challenging

Mentoring Skills: Being Courageous, Developing Action Plans, Writing Performance Criteria, and Getting Unstuck

> "Forethought enables people to transcend the dictates of their immediate environment and to shape and regulate the present to realize desired futures. (Bandura, 2018)

Historical Background

Initiative involves motivation because any organism with an inability to direct behavior to meet needs would have been eliminated during the long history of biological evolution. Despite its obviousness as a hallmark factor in all behavior, motivation is difficult to operationally define for research purposes so indirect constructs such as drives (e.g., thirst and hunger, have long been studied in animals). For humans, however, taking initiative is challenging

because there are so many possible options for using the highly flexible learning and social capabilities of our species. Many issues cause conflicts about what is practicable, valuable, and ethical—and from whose perspective—when deciding on actions.

Journey Toward the Ideal Self

Midgley (1984) believes humans have no choice but to develop ethical systems to deal with the ambiguities of the human condition because conflicting values and interpretations can, and often do, result in negative outcomes for everyone. Avoiding unethical conflict or reduction of the quality of life for others requires that one must be proactive and ready to change how one reacts to new situations, people, and challenges. The ideal self cannot be attained simply by striving harder; the actions, decisions, and performances that match growth and self-growth mindsets must also be ethically creative initiatives. Process 5 of the 2019 CLS Affective Domain ("Facilitating Growth Beyond Oneself") includes learning skills such as Behaving Honorably and Being a Catalyst, which require taking initiative to a higher level. Using the growth and mentoring skills related to the psychological perspective of initiative will enhance the quality of goals and turn challenges into sources of emotional satisfaction.

Psychological Models

Taking initiative is usually demonstrated by goal-directed action. Locke and Latham (2019) developed their goal setting theory inductively by continually updating and integrating new findings over 50 years of research and theory development. In general, they have found that outcomes such as achievements are more likely to occur by setting specific goals that are challenging but within one's capabilities. They define performance in terms of task accomplishment, which is different from self-efficacy (Bandura, 1986) and growth mindset (Dweck, 1988) theories, which focus on intrinsic motivation. Those with positive self-efficacy from successfully achieving goals across varied situations tend to set higher goals. That means that rather than working only to reduce discrepancies between actual and expected performance they move to a higher level. Park et al. found that complex goals are more likely to be completed if individuals use "backward planning" to avoid being confused by ambiguities that emerge from interim steps if "forward planning" is overemphasized (2017). PE methodologies are designed with both forward planning (preparation steps) and backward planning (formulating criteria for future assessment) in mind. Self-Growth mindset is exhibited by taking on challenges that seem beyond current potential and then implementing strategies to develop the learning skills needed for success.

Getting "stuck"—feeling unable to take initiative—is a common experience. Henning presented a counseling intervention for college students with writer's block (1981). Perfectionism, which is linked to conditional self-esteem, often disrupts writing by creating anxiety about the need for a perfect product—anything less is not worthwhile and demonstrates the same about the writer. By prescribing a "paradoxical" task (similar to Writing to Think in the 2019 CLS) involving a requirement to produce the very kind of low-quality writing that they wished to avoid, Henning found that his clients soon learned that their assumptions were wrong or incomplete: there was more value in their rough drafts than they believed was the case and they could proceed, with effective assessment, to improve what they started with.

Related Growth Insights

1. Setting *self-challenging* goals aligned with values, needs, and QoL is the basis for increasing *self-motivation* for taking still greater initiatives.
2. Growth plans that include strategies for *proactively* remediating impediments to growth (e.g., ways to overcome anxiety) reveal a component of initiative that is characteristic of growers.
3. The better one's strategy for advantageously *changing reactions* to contextual prompts, the more likely one will be able to initiate *changes in behaviors* that will improve life quality.

Related Self-Growth Insights

1. The feeling of being "boxed in"—a universal human experience—is a prompt for realizing that the situation requires fresh and creative growth-oriented initiatives to *get unstuck,* often requiring *being courageous* to attempt something very difficult.
2. Self-Growth, by definition, is only possible when the locus of control of *developing action plans* for personal growth is shifted to self.
3. Self-Growers *write* and use *performance criteria* for the development of growth capabilities aligned with their life vision and plan.

4: Reflecting *Pausing to examine thoughts and feelings about the meaning of important experiences and situations*

Growth and Mentoring Skills

Growth Skills: Practicing Reflection, Making Meaning, Valuing Growth, and Using Summative Assessment

Mentoring Skills: Self-Monitoring, Maintaining Objectivity, Being Metacognitive, Identifying New Qualities, and Providing Growth Feedback

> "Judgment is an act of rational consciousness, but decision is an act of rational self-consciousness… the rationality of decision emerges in the demand of the rationally conscious subject for consistency between his [sic] knowing and his deciding and doing. (Lonergan, 1957/1992)

Historical Background

Broad life contexts and structuring influences such as culture produce patterns in one's reactions, choices for meeting needs, and development of values. All of these usually occur outside one's awareness until specifically examined with a mentor's help or through self-mentoring if one's reflective skills have become strong. Insights from philosophers such as Midgley (1984), who analyze social as well as intellectual history to promote understanding of human nature, allow one to step back to better monitor and assess the impact of one's culture on the types of growth goals one selects and how one thinks about the ideal self. Expansion of growth and self-growth capabilities is especially dependent on *reflection*, a process defined as taking time to examine one's past performances and experiences from alternative perspectives to augment or improve understanding and meaning.

Journey Toward the Ideal Self

Reflection skills are developmentally natural yet very challenging to grow and deepen (Leise, 2010). Goupil and Kouider summarize developmental research showing that a "core metacognitive" capability exists from the first years of life and matures slowly from this rudimentary and implicit (unconscious) beginning to more explicit capabilities during adolescence, young adulthood, and beyond (2019). Reflection includes two levels of metacognition ("second-order" awareness of one's cognitions): capturing content and meaning from one's mental processes, and articulating and communicating this knowledge to others in meaningful ways. It is not a singular or explicit skill; effective self-monitoring and metacognitive self-regulation are also important for recognizing errors and falsehoods that must be dealt with as inputs to the process of reflection. As a practical matter, even adults often fail to recognize errors in sources of information and have a tendency to be overconfident (e.g., to indicate "Yes I know") even when unclear (Dunlosky & Metcalfe, 2009). Reflection is the primary self-regulating process for keeping self-growth focused on a purposeful journey towards an ideal self.

Psychological Models

Kegan's (1982) "developmental-constructivist" theory integrates the research and insights of major theorists, including Piaget's knowledge development (1952), Anna Freud's personality and psychopathology (1936/1992), Jung's psychology and the meaning of life (1934/1964), Erikson's life-long stages of development (1963), Kohut's self-psychology (1971), and Kohlberg's moral development (1976). Kegan concurs with Fingarette (1963) that humans are "meaning-makers" whether this is expressed as formulation of prediction-oriented theories or as an existential process of generating new visions. Kegan describes a "zone of mediation" where meaning is made by the ego, the self, or the person. The self as the zone of meaning making is one among many functions that make up the person.

Reflection is influenced by many factors including biased perceptions and differences in how life experiences become represented in memory. Tulving pioneered research on *episodic memory*, which is the automatic ("autonoetic") record of experiences that makes "time travel" (going to the past or imagining the future) possible (2005). He considers episodic memory to be a specialized extension of *semantic memory*, which is the general ability, shared with other sentient beings, to learn and retain knowledge. Rosenfield asserts that consciousness is the continual reprocessing of many stimuli, including memories of knowledge and experiences (1992). Recollections include not only the remembered event, person, or object, but also the person who is remembering. It has long been known that memories are filtered to fit one's existing "cognitive scripts" (Bartlett, 1932; Schacter & Addis, 2007) and can be false (Van Damme et al., 2017). Memories from adolescence and young adulthood are characterized by a "reminiscence bump" (Østby & Østby, 2018) for novel and meaningful experiences such as first relationships, initial life successes, and life

decisions that are more significant than those remembered from childhood. Shum (1998) found that people generally think of life as a series of episodes, which means that memories are organized around transitional "landmarks" that are times when individuals are likely to be more open to change.

Grossman et al. have demonstrated the empirical validity of *distanced self-reflection* (writing reflection diaries in third person rather than from the egocentric first-person perspective) as a practice that increases wise reasoning in daily life (2021). Moving away from the subjectivity of a self-centered viewpoint tends to enhance ability to perceive and assess experiences with greater reliability and with more consideration of the long-term implications of current responses.

Cultural influences create varying reasons for examining memories. Olney, for instance, contrasts St. Augustine's total confidence that truth can be extracted from memories with those of playwright Arthur Miller who presents ways that memories seem superseded, distorted, and destroyed in contemporary society from living with discontinuities and contradictions regarding trust, truth, and meaning (1998).

Related Growth Insights

1. *Quality reflection* supports planning and execution of growth of selected capabilities through *summative analysis* of needs, weekly assessment of progress, and annual measurement of growth.
2. The *meaning of growth* continues to increase as one achieves *valued outcomes* that one attributes to growth plans, personal efficacy, and a sense of ownership.
3. Growth capability increases each time one takes stock to *gain insights* about how growth has enhanced QoL and motivates planning of new opportunities to develop one's growth-oriented life scripts.

Related Self-Growth Insights

1. Growth in *self-monitoring* skills during new and different experiences will enrich reflective analysis by *improving recognition of new personal qualities* with potential to expand the breadth and depth of one's QoL.
2. A self-grower's aspiration is to *preserve objectivity* as much as possible by selecting a frame of reference for reflection on past experiences that will be most relevant for forming inferences about growth of future capabilities.
3. The existential process that mediates creative insights about meaning and QoL—a self-growth mindset—entails using metacognitive *reflection on feedback* to develop transformative plans for future growth and self-growth.

5: Seeing the Big Picture *Extrapolating from the moment to gauge its significance for one's long-term goals and life plans*

Growth Skills: Updating Life Vision, Setting Growth Goals, Focusing on Self-Improvement, and Analyzing Performance

Mentoring Skills: Being Philosophical, Determining Future Match, and Determining Unmet Needs

> "Many of the things people seek are achievable only by working together through group effort. In the exercise of collective agency, they pool their knowledge, skills, and resources and act in concert to shape their future. (Bandura, 2018)

Historical Background

Life's complexity has significantly increased every half century over the past three centuries and now increases even more during every generation and every decade. Although humans have always adapted their behavior to meet the conditions of their lives, the powerful contemporary forces of change can cause individuals to lose sight of their life direction because they are unable to size up what they are experiencing so they can step back to consider what to do. For example, contemporary society greatly influences the way work and family situations "spiral up" or "spiral down" depending on whether circumstances are advantageous or disadvantageous (ten Brummelhuis & Bakker, 2012). What provides satisfaction in the present may not be beneficial or sustainable for the future one has in mind. Use of societal opportunities to overcome risk factors through education, job opportunities, and support systems will succeed to the extent that individuals manage to make sound choices even under conditions of uncertainty (Kahneman, 2011; Kahneman et al., 2021).

Journey Toward the Ideal Self

Midgley, in considering the sources of "human nature," argues that humans have evolved significant cognitive and social capabilities which make possible harmful—as seen in the history of war and aggression—as well as beneficial decisions, beliefs, and behavior (1984). Her position is that a constructive path has the most promise for increasing our capabilities to produce good and ethical outcomes that benefit self, others, and the world. One of the implications of the wide scope and complexity of human responses is a need to formulate ethical values and principles that provide some guidance for self-consistency of choice-making. Merleau-Ponty, known as an existential philosopher, was also a psychologist who analyzed the phenomenology of perception and succeeded Jean Piaget in 1949 as Professor of Psychology and Pedagogy at the Sorbonne (1945/2002). Bakewell comments that Merleau-Ponty

> …saw quite calmly that we exist only through compromise with the world—and that is fine. The point is not to fight that fact, or to inflate it into too great a significance, but to observe and understand exactly how that compromise works (2016).

Self-Growers take this worldview with every life activity as they seek the special meaning of who they are within the moment.

Psychological Models

Heath and Heath (2013) and Redish (2013) emphasize that seeing the bigger picture is important in effective decision making because it expands the options being considered. It is less likely to find relevant big picture information to assess the future opportunity value of a present situative choice if a yes/no decision frame is used. Hess & Queen explore adult capabilities for making sound judgments and decisions, i.e., seeing the big picture, in life situations (2014). For example, *hot cognition* (versus "cold cognition,"meaning basic mechanisms), focuses on dynamic processing of affect, motivation, and goals relevant to energizing and directing cognitive attention to relevant information (see Brand, 1985; Zelazo & Carlson, 2012). Growth in social capabilities gained from life experiences therefore plays a significant role in how well persons at any age handle social and emotional challenges that are relevant for considering the bigger picture—even in specific situations that typically bias perception. More psychological detail has emerged from empirical research that clarifies how relevance and meaning are useful criteria for sizing up how to proceed on one's life journey when faced with uncertainties.

Priniski et al., in a review of research centered on what is known about how to make education relevant and meaningful, propose a unifying conceptual continuum including three phases—not rigidly defined—of meaningfulness: personal association, personal usefulness, and identification. School learning is often "associated" with some interests that are not important for one's personal life—and therefore are not high in personal meaningfulness (2018). *Personal usefulness* refers to goals of importance to an individual such as learning a new skill. *Identification* means that the learning has value because of its connection to significant roles or personal characteristics, as in the case of enhancing a specific value. Priniski et al. focus on three major theories (interest development, expectancy-value, and self-determination) in motivation literature to demonstrate that their relevance continuum provides commonality of terms, integration of scholarship, and increased potential for creative intervention. Among their many examples is culturally relevant education, which emphasizes positive assets rather than deficits, and is a model of how to increase "affordances" (opportunities) for women, members of minority groups, and first-generation college students, all of whom find it difficult to keep their individual goals in focus because of the substantial value they place on helping their families and communities. Harackiewicz et al. found that the intervention of writing about the personal meaning of course material is especially effective to stimulate first-generation college students who are also underrepresented minorities (in higher education) to identify relevant insights about how learning may be important and attainable for themselves while they also maintain connections to their cultural values and communities (2016).

Mueller surveyed creative innovations in science, academia, music, and patents to identify where good ideas come from (2019). Increasingly, it appears that more intensive work within an already well-defined field has less productive impact than taking a larger viewpoint (e.g., by seeking out interdisciplinary challenges). New knowledge now tends to be produced by research teams and involves recombination of ideas in a field with crossovers from adjacent areas of knowledge. The implications for individual growth and self-growth are that the increasingly complex conditions for innovative work described by Mueller mean it must be considered normal to share ideas, success is increased by joining working teams, working with a performance coach can expedite finding of a creative focus and avoidance of blocks, and combinations of ideas from areas of knowledge that complement one's own are likely to be stronger than staying within one's discipline.

Related Growth Insights

1. Writing to think can expand one's *life vision* by drawing connections between one's cultural attitudes and one's desired areas of growth by identifying cultural sources of strength as well as cultural impediments that influence pursuit of full and meaningful QoL.
2. Creating a *life vision* based on a wide range of experiences increases ability to clarify *decisions about growth goals* that will improve performances in situations involving a diversity of people and opportunities.
3. The complexity of contemporary life makes it necessary to keep *analyzing key performance areas* for which one needs *self-improvement* and to seek mentoring and coaching when complexity exceeds one's current growth capability.

Related Self-Growth Insights

1. Self-Determination is enhanced by increasing considerations of life's uncertainties in one's assessments as part of increasing the validity of one's selection of growth areas likely to *match future life needs.*
2. Self-Growth must be based on thoughtful and realistic ethical judgments about how to *address potentially unmet needs* so that one's life activities and efforts are self-consistent now and into the future.
3. One's personal QoL gains more meaning by *using philosophical and cultural insights* to help focus one's increases in growth and self-growth capabilities toward contributing to broader societal and world needs.

6: Self-Validating *To recognize, understand, and accept new feelings, thoughts, and values as real*

Growth Skills: Interpreting Feedback, Accepting Feedback, Being True to Self, and Having an Assessment Mindset

Mentoring Skills: Validating Personal Impact, Defining Characteristics, Validating Added Value, and Ensuring Reliability

> "By maintaining distinctions among various aspects of the self, one is more likely to maintain positive feelings about some aspects, which act as a buffer against negative happenings or negative thoughts about other specific aspects. (Linville, 1985)

Journey Toward the Ideal Self

The capability to self-validate one's feelings, thoughts, and values is significant for self-coherence, the central need in Dweck's (2017) model, but also for another central capability: realistic self-assessment of growth and self-growth. Personal subjectivity is a source of risk for biased memories, and therefore, interpretations, of what has occurred in life situations. Kegan observes the "embeddedness" of individuals in specific and limiting mindsets, especially in early stages of development (1982). Niese et al. describe how personal beliefs based on stereotypes such as "Women don't do well with math," can bias memory of actual life experiences by excluding many experiences inconsistent with present negative beliefs (2019). Their research verified that first-person imagery results in greater use of sensory information in reconstructing life events, which reduces the potentially problematic role of abstract beliefs such as stereotypes which provide overly general descriptions (see, for instance, Fiske et al., 2007). As noted in the discussion of seeing the big picture, Grossman et al. found that taking a third-person standpoint for reflections can enhance their objectivity, which is valuable for self-validation (2021). Consciously selecting reflection strategies, as with first person versus third person writing, helps with addressing subjective biases such as falling into stereotyping and other abstract representations that decrease accessibility of details likely to stimulate new insights from situated experiences.

Psychological Models

Weinstein et al. examine the "integrative process" that must occur to increase the consistency between one's current self-concept and a future self-concept (2013). Awareness, ownership/autonomy, and non-defensiveness are three main process elements for positive integration of the self. Individuals with these three characteristics also tend to have more energy, maintain wellness, and experience relational benefits. An avoidant coping attitude, in contrast, results in ignoring or distorting interpretations of experiences and situations such as by assuming one cannot meet expected standards, that may be the growable moments needed for strengthening self-coherence. Being able to resolve challenging situations leads to greater emotional resilience— "tougher self-esteem"—and increased

capability to integrate all aspects of self in a transcending way. Prakash et al. found that accepting present emotions tends to guard against the negative feelings that often follow evaluation, thus increasing goal-directed behavior and self-regulation (2017).

Self-Affirmation theory and research (Steele, 1988; Howell, 2017) contends that the capability to maintain and even boost self-worth under conditions of threat (for instance after a negative evaluation of a performance) is valuable for securing one's self-image and increasing the likelihood of personal growth and psychological flexibility. Steele argues that if positive images of the self are at least as strong as negative images associated with threat it becomes likely that individuals can maintain and even improve their optimism and resilience. Borman et al., in an experiment involving a large school district, found substantial effects on GPA and rate of HS graduation from a series of self-affirmation writing assignments offered intermittently from middle school to senior year of high school (2020). Matched peers who were equally influenced by stereotype vulnerability (racial) effects, but did not receive the treatment intervention, failed to experience the improvements in outcomes. By carefully timing self-affirmation assignments just before important achievement testing events, these researchers demonstrated that large-scale interventions could provide a "foot-in-the door" effect. A few assignments asking them to write about their values and aspirations started a "developmental cascade" for the Black and Latinx students in the treatment condition. Self-Affirmation strategies are similar to Yeager and Dweck's (2012) growth mindset interventions in that they target self-awareness of personal potential to reduce the acuteness of specific threats to development. These research examples make clear that small but timely self-affirmation and growth mindset interventions can improve performance by creating general and persisting optimism about personal potential.

Related Growth Insights

1. Growth experiences that maximize positive self-validation involve consciousness of level of mastery, sense of personal control, and perception of needs as contingent factors that are important *for being true to self.*
2. A self-affirming individual can move beyond the limiting effects of social and personal norms by *interpreting feedback* for growth that is aligned with the journey towards one's ideal self.
3. Individuals who become motivated about growth have developed *an assessment mindset* that enhances their capability to create meaning about experiences by *accepting feedback* to positively affirm competence, emotional stability, and self-consistency.

Related Self-Growth Insights

1. Self-Growers consciously strengthen role identities by recognizing and *defining characteristics* of experiences that add meaning and value to life roles by increasing the influence of these roles on QoL.
2. Self-Growth capability involves reflective reinterpretations of how self-concept and identity development can *ensure reliability* of self-determination of one's personal characteristics, such as personality traits, developmental stage, locus of control, and interpersonal skills.
3. Self-Growth involves becoming consciously aware of how well one is self-monitoring psychological flexibility in all areas of growth, so one can reliably determine *personal impact* and realistically assess the *added value* one has contributed.

7: Maintaining Perspective *Externally, seeing a situation for what it is and knowing the current time-dependent limits of what can be; internally, to attain a sense of balance of one's most valued emotional and spiritual self with personal mindsets, actions, and behaviors*

Growth Skills: Trusting Self, Toughening Self-Esteem, Maintaining Balance, Seeking Feedback, and Defining Performance Characteristics

Mentoring Skills: Being Nonjudgmental, Pre-Assessing, Designing an Assessment, and Being Fair

> "Why would Openness [from the Big Five Trait Theory] only be important for growth in the context of negative events? One possibility is that Openness is especially important for negative events in contrast to positive because it keeps people from defending too strongly against negative emotions, which could result in attempting to avoid thinking about negative events and even write them out of the life story entirely. (Lilgendahl & McAdams, 2011)

Historical Background

Maintaining perspective requires growth skills such as Maintaining Balance and mentoring skills such as Being Fair. Anna Freud (1936/1992), Carl Rogers (1961), and Abraham Maslow (1971) focus on how individuals strive to maintain a positive sense of self by gravitating toward experiences that raise self-esteem and by avoiding experiences or roles that have been found to lower self-esteem. Dweck's (2017) description of *self-coherence* points to the need for balance in meeting the multiple needs important for the self. How one reacts to psychological threats and conditional regard can disrupt self-trust and make it difficult to toughen self-esteem.

Journey Toward the Ideal Self

A growth mindset as recommended and researched by Dweck (2017) is the capability to be realistic in perception of growth opportunities by sizing up situations along with one's emotional reactions to them. A major impediment to growth occurs when an individual is unable to step back— "be nonjudgmental" —when processing negative feedback. During an assessment of a current performance or summative assessment of one's pattern of outcomes, one must be fair to oneself by not discounting strengths that will support what can be done next and why. The feelings that occur when one feels criticized (negatively evaluated) tend to be further amplified if one tries to suppress them (Buckingham & Goodall, 2019). Doing so often leads to a "rebound" effect (Wegner, 1994) characterized by rumination, which is associated with depression and other mental health problems.

Psychological Models

Participants in a study by Bergsieker et al. (2012) found it easier to omit negative descriptions than to fully report their opinions for fear of offending others. These results suggest that individuals with stronger habits of present-focused mindfulness and resilience may be more likely to recognize and make corrections to how they are reacting in the situation. Recognition of the role of subjective error when assessing reactions to negative feedback increases the probability that one can step back to process the experience and to reflect on what may have distorted the accuracy of one's representation of what occurred. Although accuracy of assessing affective processes is always approximate, it remains highly important for quality of life to consciously work to change the perspectives one habitually uses because others are possible and important to discover.

Buckingham and Goodall support a balanced perspective about feedback because of what they have discovered about a "feedback fallacy" in employee evaluations (2019). Direct and harsh feedback that focuses on weaknesses leaves individuals feeling untrusted and unaccepted for who they are. Rather than encouraging improvement, this leads to "overreaching" of evaluators who assume that how they understand their own performances is generalizable to those they are evaluating. Employees reject feedback, even if valuable, if their need for affirmation is ignored during an evaluation process. Growth and self-growth depend upon a more open mindset about evaluation so feedback can be used for accurate self-assessment.

Related Growth Insights

1. When there is evidence that one's perceptions, reactions, and behaviors within real-time contexts are not congruent with ideal self, one must seek mentoring guidance to more accurately *define performance characteristics* that need stabilization or strengthening to increase *trust of self*.
2. *Toughening* of *self-esteem* results from growth in self-observations, self-analyses, and self-assessments of experiences in dynamic situations in which one has trusted self in responses to failures.
3. *Maintaining balance* requires a combination of growth in logical reasoning—despite experiencing cognitive dissonance—and growth in successfully recognizing when emotional reactions are peripheral rather than central to success with a performance or experience.

Related Self-Growth Insights

1. Self-Growth in maintaining perspective increases as one becomes stronger at *pre-assessing* situations for opportunities that have potential to increase one's capability to recognize larger patterns—including the need to deal with incongruities—that occur across growth experiences.
2. A self-growth mindset is characterized by the capability to independently *design* and use *assessment methods* that allow one to *be nonjudgmental* even when upset about feedback that appears to be unfair or is sharply different from one's perception of what happened.
3. By modeling *fairness* and balance, individuals can support openness of others to potential self-growth opportunities.

8: Managing Energy *Maintaining psychological and physical readiness for full engagement every day*

Growth Skills: Prioritizing, Being Passionate, Seeing Prompts, Persisting, and Valuing Performance

Mentoring Skills: Raising Expectations, Being Patient, Describing Performance, and Self-Mentoring

> "The reason it is not a contradiction to be open and focused at the same time is that these contrary ways of using psychic energy share a similarity that is more important than their differences. They require *you* to decide whether at this point it is better to be open or to be focused. They are both expressions of your ability to control attention, and it is this, not whether you are open or focused, that matters. (Csikszentmihalyi, 1996)

Historical Background

Managing one's physical and psychological energy requires understanding of the conditions and processes that are energizing and sustaining rather than depleting motivation. The Managing Energy perspective is related to the Initiative perspective because any significant endeavor takes energy and there will be ups and downs in mood, physical energy, drive, and focus during the whole process. Examples of effective management of psychological energy include "flow" (Csikszentmihalyi, 1990), which occurs when one is deeply engaged in a highly valued activity or experience. Molden and Dweck argue that self-regulation of behavior must be examined on an individual basis rather than with an assumption that the choices and reactions of most people are accurately represented by average findings of research studies (2006). The 2019 CLS and the models of growth and self-growth provide innovative knowledge and processes for moving away from the static assumptions that have restricted applications of psychology for maintaining energy in daily life.

Journey Toward the Ideal Self

Relying on personal willpower alone is an unreliable way to manage psychological energy as everyone knows from New Year's resolutions that were not sustained. Duckworth et al., review the evidence for many useful strategies—including self-control and "grit"—that can strengthen responses needed for change (2018). Although individuals tend to focus on themselves as the originators of control, energy often emerges from collaboration, preplanning, setting conditions, reframing situations, creating optimistic images of one's future self, and using therapy or coaching to help one resolve blocks to moving ahead with goals. In addition, sustained energy comes from maintaining balance between work and personal life, attending to physical health, renewing readiness for action by getting enough sleep and rest, and by nurturing valued relationships.

Psychological Models

Baumeister, in a review of research on willpower, finds that it is a real and sometimes powerful resource for getting things done by simply pushing forward; however, willpower is effective only for actual capabilities (2011). Baumeister (2011) and others, such as Vohs et al. (2008), report that intense decision-making can cause "ego depletion," a lessened ability to manage cognitive load, which has been ascribed and measured in some studies as related to lowering of brain glucose. However, Forestier et al. conclude that ego depletion is not an accurate explanation of willpower failures because multiple self-control components must be included such as capacity, resources, and willingness to act (2022). In addition, self reports of fatigue can easily be based on cognitive interpretations of motivational depletion when the measurement of self-control occurs in an emotionally conflicting situation.

It is well documented (see, for example, Shin & Ariely, 2004) that deciding can be difficult because it means one must forego alternatives—it often feels less risky to "keep the door open" to one's present mode of operation. Thomson et al. (2015) have explored the mental resources required for vigilance and controlling of mind wandering. Research by Rosenbaum, et al. on "pre-crastination" (choosing low-priority tasks) offers an alternative interpretation of cognitive load management that occurs when one quickly completes a task so it can be checked off one's list (2019). A risk of this strategy is that a routine task may be prioritized over a critically important one. Assessment of inclinations to proceed in ways that cause ego depletion or involve pre-crastination helps with recognition of the effects of these and other flawed strategies on authentic passion and energy. In contrast, increases in growth capabilities related to QoL make it possible not only to sustain, but to increase one's energy level for wise pursuit of outcomes aligned with one's interests, values, and goals (Milkman, 2021).

It often requires longer-term planning to set up conditions and capabilities that can reduce stress reactions and increase resilience. Meichenbaum's stress inoculation training incorporates many skills found in the 2019 CLS Affective

Domain related to emotional self-management, especially monitoring of self-statements, modification of beliefs, and changes of performance in stressful situations (1985, 1993). All of these are consistent with the emphases of the constructed emotions and mindset research (e.g., Barrett, 2017; Dweck, 2012) in that they are strategies that help one step back rather than acting impulsively. Meichenbaum's typical training procedures include phases for knowledge/education, skills acquisition, and follow-through. The specific goal of *relapse prevention* is achieved by strengthening performance capabilities in increasingly challenging and stressful situations. Saunders et al. (1996), in a meta-analysis of 37 studies, found stress inoculation training to be an effective means for reducing performance anxiety, reducing state (situational) anxiety, and enhancing performance under stress in applied work settings (1985, 1993). The results also indicated that effects could be achieved by less experienced trainers and with diverse populations. Motivational Interviewing is another counseling intervention that helps individuals learn to focus on actual needs and avoid ineffectual emotional reactions to their life situations (Miller, & Moyers, 2017).

Related Growth Insights

1. Choosing from life activities, experiences, relationships, and decisions those that energize *passion* will make obstacles seem like challenges rather than barriers that do not deplete energy.
2. Ongoing motivation for projects and performances, even under stressful conditions, can be sustained when self-statements about the *value of performance* are combined with previous growth from *persisting* to drive resoluteness to achieve even more.
3. Productivity is an energy generator. *Setting priorities* to do urgent and important tasks first and pre-thinking about situations to readily *recognize the prompts* for efficient decision-making, will increase efficiency, preserve energy, and prevent declines.

Related Self-Growth Insights

1. Recognizing what one can productively evolve in relationships, improve in environmental conditions, increase in performances, and augment in growth capability allows one to *be patient* about everything else so one can use self-growth development to work its magic over time to conserve and eliminate energy waste.
2. Fundamental to *self-mentoring* is self-challenging and moving beyond current capabilities; the way to maintain energy in the long run is to use the motivation that growth generates.
3. *Raising expectations* of what one expects from life roles motivates careful *description of* new areas of *performance* and development of self-control skills to focus energy on achieving QoL benefits that match these expectations.

9: Enhancing Quality of Life *To maximize, short and long-term, one's personally defined quality of life*

Growth Skills: Strengthening Role Identities, Applying Criteria, Maintaining Standards, and Identifying SII Opportunities

Mentoring Skills: Writing Measurable Outcomes, Setting Criteria, Selecting Measures, Being Compassionate, and Establishing Standards

> "At the level of self-actualizing, many dichotomies become resolved, opposites are seen to be unities and the whole dichotomous way of thinking is recognized to be immature. For self-actualizing people, there is a strong tendency for selfishness and unselfishness to fuse into a higher, superordinate unity. Work tends to be the same as play; vocation and avocation become the same thing. When duty is pleasant and pleasure is fulfillment of duty, then they lose their separateness and oppositeness. The highest maturity is discovered to include a childlike quality, and we discover healthy children to have some of the qualities of mature self-actualization. The inner-outer split, between self and all else, gets fuzzy and much less sharp, and they are seen to be permeable to each other at the highest level of personality development. (Maslow, 1962)

Historical Background

Seligman and Csikszentmihalyi introduced *positive psychology* as "A science of positive subjective experience, positive individual traits, and positive institutions promises to improve quality of life and prevent the pathologies that arise when life is barren and meaningless." (2000). Positive psychologists initiated a scientific field of research that has successfully addressed the main topics of the older humanistic psychology. Seligman agrees with Maslow that capabilities must be self-developed and involve growth in increasingly challenging roles and areas of performance and

experience that are valuable from a personal perspective (2018). Seligman's PERMA model (positivity, engagement, relationships, meaning, and achievements) has become a prominent formulation for measuring subjective well-being.

Journey Toward the Ideal Self

Thich Nhât Hahn, a contemporary Buddhist, believed that an integrated ethical frame of reference is the ultimate goal for quality in living (2014). Stanley and De Brigard caution that everyone can highlight praiseworthy deeds and forget or minimize moral transgressions (2019). Readily believing, without careful assessment and reflection, that one is currently better than one used to be can distort reality by allowing a sense of satisfaction with the status quo.

Recognizing and using opportunities for effective use of the PE SII assessment technique (identifying strengths, improvements, and insights for a performance and its outcomes; Wasserman, & Beyerlein, 2007) strengthens capability to engage with the reality of one's present functioning so growth toward an ideal self can be reliably planned. The QoL perspective is subjective and varies by individual, but new tools such as the Self-Growth Methodology (Jain et al., 2020) describe practical steps for creating a personalized life plan with criteria, standards, and measures for the quality one desires from life represented by one's personal framework (King-Berry et al., 2021).

Psychological Models

Fredrickson's "broaden-and-build" theory proposes that special moments marked by positive affect have an accumulative effect on *flourishing*—living within an optimal range of human functioning—by inducing a widening effect on thoughts and actions through increased creativity and exploration (2001). Reflexive or avoidant reactions ("fight or flight"), which happen quickly and require little cognition, have a place—if carefully monitored—because these help with meeting basic survival needs and are energizing in the moment. However, it is the positive skills that must be carefully built to increase QoL. Being Positive is a learning skill that plays an important role in flourishing by increasing attention to development of capabilities, improving mental, physical, and emotional functioning, and challenging fixed mindsets. Flourishing also requires success in dealing with negative experiences and emotions that create important challenges that can be overcome by developing new capabilities (Fredrickson and Losada, 2005; 2013).

Neff contrasts self-compassion, which has roots in Buddhism, with self-esteem, the cognitive representation of self-worth (2016). Self-compassionate individuals realize the importance of accepting themselves as human and of being non-judgmental in interpreting experiences, especially negative events, when reflecting on self-worth. *Self-esteem* was described by William James (1890) as a judgment about competence in life domains important to a person—and it has long been considered an essential characteristic of mental health. More recent research, however, suggests that a focus on self-esteem can also be a risk factor if it influences individuals to be less autonomous, especially when social influences are significant. Growth skills such as "Strengthening Role Identities" and "Maintaining Standards" are much more likely to occur if mindfulness is tempered with kindness toward self and respect for common human needs and aspirations.

Related Growth Insights

1. *Flourishing*, as defined in positive psychology (Keyes & Haidt, 2003), requires prioritizing, aligning decisions to QoL, and focusing on broadening and building capabilities that *strengthen role identities.*
2. A person's QoL can be enhanced by *applying* broad *criteria* that support daily improvement in decision making and *maintaining standards* that are consistent with positive self-worth.
3. QoL growth opportunities can easily pass unnoticed without a life plan that includes conscious *assessment* of *opportunities* for making distinctive—even dramatic—changes.

Related Self-Growth Insights

1. Self-Growth requires that one autonomously *select* and self-manage carefully thought-out *criteria* for defining the growth capabilities needed for one's life journey.
2. *Being compassionate* is highly valued because it refocuses consciousness beyond self to the universality of the human need for positive self-regard. Even for those who have *established high standards* in their growth, it is important to avoid self-judgments that decrease QoL due to lack of self-compassion.
3. *Selecting measures* for achievement of *written* QoL *outcomes* is an individual process for use during quarterly and annual summative assessment and reflection that requires personalized (customized) indicators to measure progress.

Conclusion

The PE framework evolved from an emphasis on the functions of knowing, learning, and learning to learn to an emphasis on the performance foundations of growth and self-growth. This expansion has created the need for greater awareness of the psychological aspects of contexts and situations that offer opportunities for development and self-development of capabilities. Conscious strengthening of distinctive mindsets and capabilities has become central not only to the educational aims of PE but also to the personal life journeys of individuals. An innovative resource introduced in this paper is nine psychological perspectives that identify psychological factors that challenge individuals in varied ways depending upon their history of development and their range of competencies with learning skills from all domains. The perspectives are psychological factors or constructs that are well-represented in psychological scholarship and are presented to provide enough information and insight to support their use in planning, performing, and assessing of learning, performance, and growth experiences that align within each perspective. The self-validation perspective, for example, highlights the importance of building a resilient self-concept as a buffer for negative experiences. Managing energy as a perspective brings out insights about the importance of making situative choices such as consciously deciding whether it is more valuable to expend mental effort on an open exploration of an issue or on a focused analysis of an element of the issue. By having a broadly based range of psychological perspectives to consider, anyone interested in personal and performance growth will discover new ways of conceptualizing assessment targets and of using reflection to enhance QoL along the life journey.

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Roles of Performance Mentoring and Self-Growth Coaching in Developing Human Capability

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Abstract

Society has embraced mentoring and coaching as two professional roles that contribute significant value to society, organizations, and individuals. However, these two roles often overlap in function and purpose which has led to general confusion about their respective contexts, purposes, capabilities, and performance expectations. The aim of this paper is to differentiate the characteristics of mentoring and coaching guiding practitioners to Process Education resources and providing strategies for best practices. Further, the integration of these roles is depicted. A person who is capable of performing the roles of both performance mentor and self-growth coach can help clients learn how to play both roles for themselves.

Introduction

Differentiating self-growth from growth is crucial for establishing boundary criteria and conditions for the many variations of mentoring and coaching within both lay and professional contexts (McLeod, 2004; Wilson, 2016). The distinctions between growth and self-growth directly help to improve the precision of definitions and descriptions of mentoring and coaching as roles that serve a wide array of users. The processes of mentoring and coaching share some common features that are highlighted by focusing on their roles within holistic personal development of capabilities. Nussbaum's (2011) capability philosophy describes how this development will increase quality of life effects across family, work, community, and other contexts (King-Berry, 2021). The Process Education framework is a resource for substantive practice methods, including the integration of learning skills (Apple et al., 2016) and the recognition of quality issues that can greatly enhance the value of servant leadership (Greenleaf, 2002) roles for expanding the scope of living experienced by individuals. Mentoring and coaching that produces increased consciousness of how to enrich one's personal environment results in an increase in growth opportunities which can be actualized by effectual decisions related to one's life journey toward an ideal self (Apple et al., 2021).

The remainder of this paper will provide general background on contemporary definitions and uses of both performance mentoring and coaching. Next, the characteristics and practices associated with these two specialized roles will be detailed. First, performance mentoring which facilitates performance development, growth, and self-regulation will be discussed. Then a discussion of self-growth coaching which facilitates life visioning, self-growth, and self-determination will be presented. Practitioners for each of these roles are provided prompts and suggestions to facilitate them effectively, help with overcoming blocks, and enhance the significant relationship factors that produce shared meaning in addressing Quality of Life (QoL) issues. Finally, the integration of performance mentoring as a distinctive process within self-growth coaching is emphasized.

Definition and Features of Performance Mentoring and Self-Growth Coaching

The International Mentoring Association (IMA, 2020) defines mentoring as a role used to support development across many life endeavors for youth and adults. Mentoring can be helpful in many contexts and life challenges that require growth for future success. A mentoring relationship must be supportive and confidential to allow safety for mentees as they try new challenges, recover from mistakes, and learn to use feedback to deal with vulnerability, especially when it is a publicly observable performance (Van Slyke, 2021). It often serves to energize mentees to consciously face life transitions by becoming life-long learners who are more capable of autonomously setting the stage for further advances in their growth (Apple et al., 2015).

The International Coaching Federation (ICF) describes coaching as a creative, thought-provoking process for maximizing personal and professional development. The ICF identifies eight core coaching competencies organized under four broad categories: Foundation, Co-Creating the Relationship, Communicating Effectively, and Cultivating Learning and Growth (ICF, n.d.). Companies use coaching programs for a variety of focus areas depending on the culture, for example GE has shifted coaching efforts from just setting personal priorities aligned to business goals to coaching that broadly supports a balance of work and life to reduce burn out. Although coaching specializations have been defined for contexts or purposes such as execu-

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tive, business, and wellness, at its core coaching always involves a focus on holistic, personalized growth.

Although performance mentoring and self-growth coaching share some characteristics, they have distinctive aims. The framework for both is provided by the six functions of knowing, learning, learning to learn, performing, growing, and self-growth as displayed in Table 1. Performance mentors focus on facilitating growth in performance. To facilitate this successfully, they will also need to support the knowledge and learning needed for the performance goal by increasing their client's learning to learn and growth capabilities. In contrast, self-growth coaches incorporate the performance mentoring process into the larger context of life (e.g., by expanding value and ethical based decisions made by clients) The aim of both performance mentoring and self-growth coaching is for students, trainees, mentees, and clients to establish independence as self-mentors who can support their own self-growth by integrating learning, growth, and mentoring skills related to the six functions into everything they do.

The scope of performance mentoring is more focused than that of self-growth coaching because its emphasis is on the work of improvement in specific performances that are planned for growth development, but both should include transferring ownership of future improvements to the mentee. For example, employee supervision, if viewed as performance mentoring, might focus on the growth skill of Being Self-Aware (appreciating opportunities for engaging in reflection). A supervisor might use the mentoring skill of Being Independent (seeking an appropriate level of autonomy in each role identity) to keep attention on the employees' independence in improving self-awareness skills (Jain, 2020). In practice, employees must develop separateness from their supervisor over the length of their training to prepare for their eventual role as a qualified professional themselves who models these skills (e.g., being their own self-director).

Companies can sometimes enable co-dependencies between employee and supervisor by limiting their employees' growth efforts to mandated and sometimes public interactions with their supervisors. Whelen et al. (2021) found that patient or customer expectations are often more significant than those of supervisors. Just as supervisors must detach from a sense of ownership of the actions of employees-in-training, the self-awareness of employees must stay centered on customer actions because they are a stronger basis for the success of the organization. Employees who have not developed strong self-awareness are prone to projecting their unconscious bias, observations, hypotheses, and recommendations without understanding the implications of their attachment to their customers (Ivey & Ivey, 2007).

In either role, mentor or coach, a close relationship with a mentee is developed that brings with it expectations of behaviors and ethics. Although the mentor may get something out of the relationship it is understood that the mentor should act in the best interest of the mentee and not for themselves. Proximity ethics has identified seven principles, and these align well with the values and goals of Process Education (Hintze et al., 2015). These principles have been explored in the context of the relationship between a facilitator and student. Similarly, they can be applied to relationships with mentees to better define the ethical contract between either a performance mentor or self-growth coach and their client or mentee.

The Practice of Performance Mentoring

Mentoring relationships may last a lifetime, such as helping with professional development throughout a career. The primary differences between traditional forms of mentoring and performance mentoring are that the latter incorporates additional responsibilities including

a) producing transformational changes in a shorter time frame
b) challenging mentees with greater intensity and higher expectations
c) focusing on strengthening growth capabilities that are transferable to other performances

Table 1 Six Functions of the PE Framework

Levels of Consciousness	Self-Growth Function	Performance Mentor Function
Determining what is	Knowledge	Performance (Performance Criteria)
Strengthening what is	Learning (Enhancing Knowledge)	Growth capability (Improves Future Performances)
Enhancing the process of strengthening	Learning to Learn (Enhancing Learning)	Self-Growth Capability (Increasing Growth Capability)

d) constantly exploring ways for mentees to seek their own ways of improving their performance growth, i.e., they must become capable of self-mentoring performance development to increase the quality of their growth strategies.

Performance mentoring relationships, as defined in the Process Education framework (Van Slyke et al., 2021), are short, purposely planned, intense periods to improve performances of value for involved individuals and sponsoring organizations. They are characterized as

a) a series of shared tasks to promote the growth and development of mentees

b) an intense, trusting, positive, supportive but challenging, primarily public, high-risk (change-oriented) relationship that supports mentee learning to perform in front of others, to accept challenges, to try new things, to learn from failure, and to accept performance improvement feedback

c) a complex, developmental process used to develop a mentee's performance through necessary practice and performance iterations while learning how to be an effective, reflective, life-long learner, performer, and grower

For example, GE integrates professional development within on-the-job training through practicing the Lean Principle of continuous improvement and focusing on value (Van Slyke et al., 2021). Growth skills, which are skills that help with personal development such as self-challenging, persisting, and increasing resiliency, have great value because they are generalizable to performances in future contexts. This is analogous to how a specific risk factor can inhibit performance improvement in many contexts. Performance mentors strive to support mentees in the improvement of performance quality by increasing their capability to apply selected growth skills to overcome inhibiting mindsets or risk factors (Apple et al., 2018) and to open the way to greater autonomy in how they increase and expand their future performances.

Within the educational model used in many professional fields, performance mentoring, whether referred to as supervision, intern training, on-the-job training (OJT), or simply mentoring, has the objective of producing sustainable and generalizable growth in students entering specific careers. Schön (1987) describes three distinctive facilitation practices discovered from his examination of the growth of learners as "reflective practitioners" in management and counseling internships and a psychoanalytic residency program. The results of his observations and analysis suggested three broad strategies with the potential to produce growth, which he describes as "double-loop learning" (Argyris & Schön, 1974, 1978) to distinguish it from knowledge ("single-loop learning"). First, providing modeling of effective behavior ("Follow me!") often opens the door to further elaborations and reflection by students who are unsure of how to take initiative on their own. Second, deeper engagement is often achieved by inviting learners to try out "experiments" such as slowing down a process, deconstructing a process into smaller steps, confronting "protectionism" (counterproductive avoidance of public discussion of failure), and focusing on continuation steps when stuck. Third, recognizing that mentoring can become a "hall of mirrors" if failures or experiences of getting stuck are assumed by both mentees and their mentors as circumstances that can be resolved only by expert advice, i.e., single-loop learning. Reliance on expert knowledge reflects a fixed mindset, i.e., "There is a right way." Double-loop learning parallels the knowing, learning, learning to learn, performing, growing and self-growing model of consciousness. Reliance on single-loop learning must be overcome by gaining a growth mindset—usually through mentoring—to allow openness to more malleable process strategies based on clear criteria for generalizable strategies of performance growth.

The following suggestions for performance mentors are based on resources described throughout this paper that can optimize the uses of mentoring skills to help clients grow capabilities aligned to their growth opportunities and performances. Occasions for growth can be planned, such as enrolling in an advanced training program, or can occur by chance, such as an opportunity to initiate a conversation with an admired person. The key is to build a conscious rationale of why and how a selected mentoring skill has clear potential for facilitating one or more growth skills to address a challenge. Additional exemplars are delineated in Table 2. Performance mentors who can use strategies such as these to self-mentor their own growth will attain a greater consciousness of how to facilitate growth in clients in ways that fully engage themselves and their clients in the richness of the processes that produce quality performances and growth capabilities.

To increase the quality of performances and experiences a mentee must broaden and deepen conscious generalization of growth capabilities to new contexts. Hurd (2021) indicates that growth capability is comprised of 15 components, while growth development is the process of increasing transferable learning skills to enhance the quality of life by increasing the value of all experiences, especially performances, that are related to one's individual quality of life. Nelson et al., (2020) emphasizes that the description of the performance, including the identification of key learning skills, is essential for setting the stage for mentoring performance improvements related to many kinds of

experiences and life roles. Van Slyke (2021) discusses how the Methodology for Developing Performance (MDP) is a guide for the process of strengthening performances. The MDP is listed in Table 3. Column two provides a list of growth skills from Hurd (2021) that enhance the use of the MDP.

As a performance mentor facilitates mentee growth in specific performance areas, they may consider the following strategies to be helpful when making decisions on how to help mentees initiate, assess, redirect, and reflect while maintaining a shared perspective as they.

1. Using the MDP to "plan forward" supports initiative to clarify connections between personal history and aspirational goals. Several steps encourage performance mentors and their mentees to assemble significant personal background and a life vision statement to support personalized but realistic detailing of actions for performance goals that are expected to increase certain performance areas.
2. Mutual analysis of documentation such as plans, assessments, and reflections can support the development of an assessment mindset by leading to discoveries about whether growth plans incorporate the essential criteria for quality of assessment and reflection such as specificity (progress with key improvements), consistency (repeated use of a selected technique or measure for a performance), and validity (stating identifiable milestones in the development of each growth capability).
3. A key strategy for enriching reflection-in-action capabilities is to provide time for mentees to describe their behavior in the performance situation and their perceptions of affective reactions and unexpected factors that they believe affected performance quality. Learning from experience requires time for both reflection and self-assessment (Desjarlais and Smith, 2011)
4. Helping mentees to get unstuck requires a performance mentor to examine multiple hypotheses for how a mentee can move forward. For example, the

Table 2 Mentoring Skills

Mentoring Skill	Description	Impact on Growth Capability
Self-mentoring	Engaging in intentional self-assessment leading to an analysis of self for improvement	Self-Growth can best occur by using assessment and reflection to gain authentic awareness of where one is so one can progress toward one's ideal self.
Encouraging ownership	Engaging others to accept a stake in a vision	As ownership grows, investment, commitment, desire, and quality of performance also increase.
Defining characteristics	Determining the key factors that impact a receiver's affective reaction	Growth is strengthened by clarifying, defining, and focusing on qualities related to one's openness and resilience when facing emotional challenges.
Being independent	Seeking an appropriate level of autonomy in each role identity	As ownership of one's decisions and role identities strengthen, one can become a more effective mentor of one's self-growth.
Being fair	Being objective and not letting biases, values, and petitions influence judgement	Injustices, which are impediments to growth and self-growth, must be identified and challenged as undesirable inconsistencies to be mitigated from evaluations by others as well as oneself.
Developing action plans	Creating short and long-term strategies for improvement	Strong action plans accurately and meaningfully define how growth and self-growth can be pursued.
Self-monitoring	Having a continuous camera on every performance so it can be replayed	Visualization of one's own performance and actions to make it possible to replay the "tape" later for both self-assessment and reflection to strengthen self-mentoring.
Determining unmet needs	Identifying desired characteristics lacking for receiver	Discovering and addressing what is missing in one's life will increase wholeness, strength, and power to go after life with greater fortitude, energy, and consistency.

situation may require the setting of smaller goal steps, a switch of focus to a different domain of the Classification of Learning Skills 2019, or a shift of attention from a subjective explanation to a less biased and more objective focus on actual behavior and more specific performance criteria.

5. Psychological theories, research, and practices can be a resource for new and creative concepts that can help mentees take a new approach to their explanations of their emotions, beliefs, and behavior in specific situations. Making the connections between psychological understanding and the planning of improvements in growth skill development can especially be helpful when trying to improve self-monitoring (reflection-in-action) and improving planning for impediments to growth.
6. Performance mentors can help mentees become more aware of growth opportunities by collaboratively surveying available situations and performance options to identify those likely to be relevant to growth potential. Increased consciousness of how present abilities match up with situational opportunities is a generalizable approach for developing new growth capabilities with potential to impact future creativity and resilience.
7. Boosting wellness is important for emotional and bodily self-regulation capabilities. Analyzing and reflecting on choices for performance growth related to rest, meditation, nutrition, and exercise can increase holistic awareness of positive mindsets about well-being that will increase the psychological resilience and physical energy needed for growth to become feasible.
8. Formulating and thinking critically about a set of key beliefs is essential for envisioning growth plans that will increase performance. The questions for which key beliefs are important include: How does psychological change occur? How can psychological richness be increased? How are opportunities created? Why is growth important?

Table 3 Methodology for Developing Performance

Step	Growth Skills	
Step 1: Choosing an Opportunity	Being true to self	Updating life vision
Step 2: Identify stakeholders	Strengthening role identities	Defining performance characteristics
Step 3: Clarify Expectations	Motivating self	Committing to success
Step 4: Analyze performance context	Analyzing performance	Valuing performance
Step 5: Analyze performer context	Introspection	Being self-aware
Step 6: Write the performance criteria	Applying criteria	Maintaining standards
Step 7: Produce and implement learning plan	Being metacognitive	Making meaning
Step 8: Produce growth plan	Valuing growth	Setting growth goals
Step 9: Produce performance plan	Believing in your potential	Being proactive
Step 10: Practice	Being passionate	Prioritizing
Step 11: Performer readiness snapshot	Feeling empowered	Maintaining balance
Step 12: Rehearsal	Focusing on self-improvement	Seeing prompts
Step 13: Perform	Trusting self	Committing to self
Step 14: Evaluate	Critiquing	Toughening self-esteem
Step 15: Suspend reaction	Changing reactions	Accepting consequences
Step 16: Assess practice, rehearsal, performance	Seeking feedback	Accepting feedback
Step 17: Turn Evaluation into assessment	Having assessment mindset	Identifying SII opportunities
Step 18: Interpret feedback	Interpreting feedback	Listening to self
Step 19: Update plans	Persisting	Changing behaviors
Step 20: Self-Assess entire process	Practicing reflection	Using summative assessment

9. Selecting stories, including autobiographies and media presentations, from many life viewpoints can increase the creative quality of self-discoveries from introspection, exploration of diverse worldviews, and conscious examination of one's mindsets related to growth experiences.
10. Using the MDP for "backward" planning is a strategy for systematically making corrections and improvements to life performance areas. Reformulating growth plans to enhance goals, aspirations, and values with discoveries about gaps, inconsistencies, and ambiguities will improve alignment of performance development strategies with conscious insights about how to self-mentor change.

The Practice of Self-Growth Coaching

Self-Growth coaching, known more broadly as coaching, is a client-centered, co-created relationship in which a coach facilitates a self-development process to help clients set goals, increase self-awareness, identify and assess choices, develop and execute plans for action, be self-accountable, and increase individual wisdom. Ultimately, the real value and potential of self-growth coaching is less about what is being coached and more importantly about increasing the capabilities of the whole person to be more metacognitively skillful in the present moment and more conscious of the potential for self-growth in each experience.

A self-growth coach focuses on facilitating the capabilities of self-growers to generate growth experiences, for example, taking on new endeavors that include unknown challenges. Advancing a self-growth mindset requires greater consciousness of the importance of reflecting-in-action (Schön, 1987) to discover insights that will increase the focus and success of action plans.

The stages to help produce self-growth are delineated in the Self Growth Methodology (SGM), presented in Table 4 (Jain, 2020). The mentoring skills of self-growth coaches (or self-mentors) become stronger and more flexible as they internalize the SGM. Self-Growth coaches can encourage clients to seek greater self-determination in more situations by supporting their continuing iterations of weekly reflection and scripting. As an example, a coach would help a client apply their own criteria such as psychological richness to an upcoming opportunity to turn that situation into one that increases QoL.

Self-Determination Theory (Ryan, 2017) emphasizes the need for balance between dependency and autonomy. Self-Growth coaches may start by trying to increase their client's autonomy if they feel like their life is already completely dictated by their current obligations to meet others' needs. In some cases, having too much autonomy can lead to a reduced QoL if not planned. In either case, self-growth coaching will help them identify and overcome their impediments with strategies to determine what opportunities exist and how to use them to increase their QoL most effectively.

Table 4 Self-Growth Methodology

1. Define the meaning of your life
1. Conduct values and needs analysis
2. Raise expectations
3. Determine life's quality characteristics
4. Develop broad criteria for success
2. Create life vision and plan
5. Develop your life history
6. Create a vision of your future self
7. Create life goals
8. Create milestone goals
9. Develop strategy
3. Determine your key performance areas
10. Identify your crucial performance areas
11. Conduct performance analyses
12. Develop performance descriptions
13. Set performance criteria
14. Determine performance measures
15. Systematically assess
4. Conduct risk analysis
16. Identify key risk factors
17. Determine learning skills
18. Identify professional characteristics
5. Conduct a systematic weekly self-growth analysis
19. Self-Assess
20. Develop a weekly action plan
21. Perform
22. Reflect
23. Memorialize
6. Conduct annual reflection on self-growth
24. Conduct annual reflection
25. Conduct annual assessment
26. Produce the annual growth plan

Schön's (1987) observations and insights about the practices found in professional education and supervision contexts to prepare mentees for careers illustrate the significance of performance mentoring for producing growth but do not directly facilitate self-growth as a capability or mindset. Continuing beyond growth to self-growth requires building on different performance challenges. For example, by moving beyond career aspirations and achievements to address aims of interns to become wiser, more compassionate, and more capable of personal transformation as well as professionally able to serve others in need of change. A self-growth mindset requires an openness focused on "composing" one's life journey by integrating performance growth with a higher level of consciousness about broad criteria for QoL. The broad criteria (personal life mantra) help to select experiences that deepen meaning gained from many kinds of life opportunities, upgrade one's envisioning of an ideal self, and are valuable markers for guiding life-changing decisions. Adding coaching skills and self-growth capability to the professional education of coaches could increase consciousness of growth experiences as a consequential criterion especially relevant to this profession, but generalizable to many others.

Self-Growth capability emerges from a history of successful growth, that is, advances in performance, that becomes available for future life choices. One area currently under development is identifying impediments to self-growth and the best mitigation strategies (Apple, 2019). The highly challenging level of consciousness required for self-mentoring (personal control of growth) evolves from making life decisions that demonstrate command of how to invest in growth capabilities that increase QoL and that also answer the question "Who am I?" in increasingly complex and meaningful ways as the journey of life proceeds.

Each of the mentoring skills adds distinctively to what a self-growth coach can offer. For example, by fostering growth related to being compassionate, a coach can help clients go beyond empathy (Bloom, 2016), an immediate emotional connection to someone else's plight, to compassion, a more reason-based, fuller envisioning of the life stories of diverse individuals and their life circumstances. The level of consciousness of a self-growth coach must be higher than that required for the more focused performance mentor role. Coaches who challenge themselves to live the values implicit in the mentoring skills they use, can gain more complex insights associated with a fuller consciousness of the meaning of life that is gained by challenging themselves more than they challenge their clients.

A coach helps clients develop a broader and deeper understanding of themselves by taking some time to mutually explore these matters together when working on the second stage of the SGM, Creating a Life Vision and Plan. Formulation of credible plans for an optimal life journey also must account for the "layers" of historical influence from family of origin, generation cohort, culture, geography, and other general factors. A factor that decreases the effectiveness of those in the self-growth coaching role, and in performance mentoring, is failure to recognize how interpretations of processes may have become overly abstract and limiting which is a characteristic of a fixed mindset, (Molden & Dweck, 2006). In hindsight, memories of learning any complex performance can easily become overlain by the automaticity which makes present expert performance seem obvious, even though it is not to those who wish to build expertise. A compassionate coach should have no preferential perspective by which to infer how early family experiences, schooling, friendships, personality style, negative life hits, adult relationships, career success, and many other factors have shaped client experiences. Their goal is to help clients reduce personal subjectivity so they can make possible a more objective view of their life experiences and relationships.

Insights about the meaning of personal history can be further increased by using philosophical and cultural insights to analyze the meaning to be gained by wisely contributing to broader societal and world needs. Having this wider perspective increases the flexibility to use both forward and backward planning (Park et al., 2017). This perspective helps to avoid unproductive paths, which often are revealed by difficulties in planning action steps when experiencing a block. From the perspective of a coach, every mentoring skill provides a window of possibility for advancing a client's growth capabilities. From a client's perspective, the value from collaborating with a coach who is self-compassionate will be self-evident from shared experiences of feelings, thoughts, and behaviors related to more productive and satisfying QoL outcomes.

Exploration by coaches of how to strengthen their own significant life roles is a key growth skill that can enhance openness and creativity in the process of preparing mentees and clients to enhance growth. Integrating growth capabilities with current awareness of identity and self-concept will lead to self-growth. This is accomplished by raising consciousness of how to autonomously decide the direction of one's life journey by initiating actions, assessing life experiences, reflecting on life choices, and redirecting plans.

The following self-mentoring strategies are illustrated as a guide that self-growth coaches can use to raise growth challenges for themselves while serving clients.

1. Planning "forward" through the stages and steps of the SGM creates value for both self-growth coaches and clients if self-growth coaches reexamine, in par-

allel with clients, their own life visions, broad criteria, growth plans, and assessments of risks related to decisions about growth.

2. Planning "backward" in use of the SGM will help with corrections in clients' life journeys if self-coaches engage in parallel assessment and reflection about their own growth and self-growth decisions and the accomplishments of their life journeys.
3. Being self-honest is an example of a mentoring skill for selecting and validating growth targets that are consistent with the broad criteria selected to guide one's life journey.
4. Each life situation offers opportunities to apply different mentoring skills to transform growth and self-growth efforts; selecting mentoring skills from both client and coach points of view is a method for validating, through contrast, the rationale and plans for the growth and self-growth components chosen for a situation.
5. Conscious exploration of the expertise of others who have developed beyond one's present real self makes it more likely that one will identify new capabilities that feel challenging and rewarding to pursue.
6. Examining broad criteria through reflection writing is a means to self-affirm and self-validate behaviors, values, and beliefs as consistent with one's evolving self-concept. Consciously exploring the QoL of others makes it more likely that one will identify new broad criteria associated with increased psychological richness of life.
7. Directing attention to learning skills from the highest levels of the CLS 2019 Affective Domain is a strategy for challenging the status quo as an impediment for growth aspirations.
8. Everyone has potentially valuable growth areas that are "over-shadowed" by traits, virtues, and capabilities that are prominent in behavior and in consciousness. For example, being overly conscientious about certain performance areas may overshadow needs and potential self-discoveries related to less prominent traits, virtues, and capabilities that also could be developed to diversify and intensify QoL outcomes.
9. The Stoic, Naikan, and Buddhist philosophies, as well as others provide insights and practices for dealing with life's suffering and risks through developing compassionate and ethical capabilities for extending oneself to others and the world.
10. Planning and implementing personalized strategies to overcome and transform situations associated with uncertainty and emotional peril will increase resilience in responding to major risks to one's well-being and life success.
11. Increases in wisdom reasoning can be instigated in reflective thinking and writing by creating psychological distancing away from the norm of using an egocentric (first person) point of view. Taking a third-person vantage point when reflecting can increase intellectual humility, sensitivity to relationship issues, openness to diverse outlooks on life, and insights for integrating broad criteria with experiences to increase QoL.

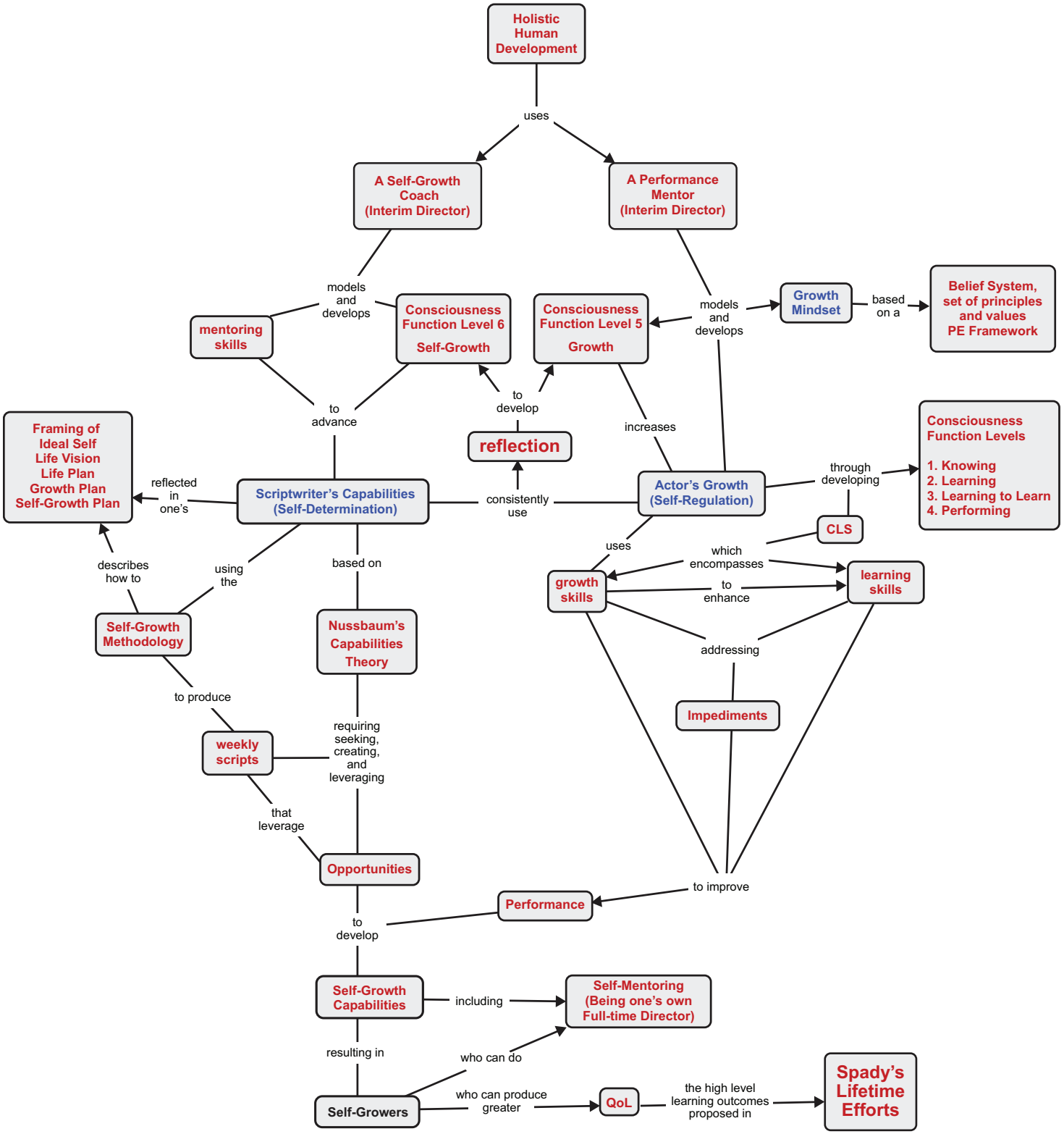
Integrating Performance Mentoring and Self-Growth Coaching

Coaching pioneer and ICF Master Certified Coach Dave Buck (2016) calls for moving coaching from a transactional focus on achievements to a transformational emphasis on QoL. Dramatic changes in the world over the last 20 years have challenged coaches to use the relationship to more effectively address what clients want and need today. Experiences of isolation, such as the 2020/2021 COVID-19 restrictions (Fortgang et al., 2021), obsessive attention to electronic media, and alienation caused by experiences of racist, sexist, and ageism attitudes (Comas-Diaz et al., 2019) reduce developmentally constructive engagement in family, education, and work. These and other risk factors interact with a rapid rise of complexity in contemporary societies that amplify the need for effective interventions. The professional responsibility and challenge for performance mentors and self-growth coaches is to support mentees and clients in discovery of opportunities for creating new capabilities that will overcome risks and limitations by developing and strengthening growth and self-growth mindsets and capabilities.

Although performance mentoring and self-growth coaching are uniquely different roles, there has been a growing interest and demand by clients and organizations for the combining of coaching and mentoring during client engagements (Brefigroup, 2018; Learning in Action, 2019; Buck, 2016; McLeod, 2004). It is important to note, however, that mentors often use coaching skills, but coaches rarely use the mentoring process and skills except in the context of mentoring other coaches (Gabay et al., 2019).

The concept map, presented in Figure 1, depicts the integration of the roles of performance mentor and self-growth coach. Using the example of supervision, an insight for performance mentors is that effectiveness in

Figure 1 Performance Mentoring Relationship to Self-Growth Coaching



this role, which has growth as its aim, is dependent on the use of a set of growth and learning skills to help employees meet performance goals (actor's role). Whereas self-growth coaches use mentoring skills to creatively and strategically move beyond specific performance goals to help employees with decisions about how to align performance growth plans with broader life values and expectations (scriptwriter's role). The goal of both is to support and facilitate the development of individuals who can self-mentor by consciously using the capabilities and associated mindsets of mentors or coaches for themselves (director's role).

Self-Growth consciousness can be equated to a movie director's level of consciousness of all facets of the movie while they are creating it so that they can adjust the script to align to the vision. The elevation and creation of a raised level of consciousness is achieved when a self-growth coach empowers clients to increase their level of awareness of their own internal processes of learning how to learn through actions as they think, respond, and later reflect on their actions (Apple, 2021). Performance mentoring is suited to support the strengthening of consciousness associated with knowing, learning, learning to learn, and performing. Self-Growth coaching matches the characteristics of growing and self-growing (Leise et al., 2023). The six functions, delineated previously in Table 1, can be aligned to three different levels of self-consciousness one can have, starting with determining what is, elevating to strengthening what is, and lastly enhancing your processes of strengthening.

Conclusion

A shift to a performance mindset within the coaching profession along with an increased demand to combine mentoring within coaching provides a tremendous opportunity for the same person to provide performance mentoring to develop growth capability and then to use generalized mastery of growable experiences as opportunities to develop greater self-growth capability. In the role of performance mentoring, a coach can enrich the relationship through iterations focused on specific developmental areas while also intuitively shifting to self-growth coaching to empower clients to own the mentoring process as they strengthen their QoL (Learning in Action, 2019).

If a mentor/educator successfully uses mentoring skills to help others develop growth skills, the result is growable experiences. When a mentor/coach is successful in transferring mentoring to the performers, they become autonomous in the use and development of mentoring skills (self-mentoring) to transform growable moments into their own self-growth experiences. Self-Growth is experienced as an identity-enhancing role characterized by learner ownership, growth goals, a performance mindset, desire to improve quality, accurate self-monitoring, honest assessment of performance, and wise decision-making that enriches life. Ultimately, the goal is to become one's own self-growth coach so one can design and create self-growth experiences on a daily basis from planned and unplanned growable moments.

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Lessons from a Large Scale Implementation of Academic Coaching

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Abstract

The University of Maryland Global Campus sought an impactful way to improve the learning and persistence of its students. Beginning in 2018, a team explored the existing model of education, the feelings and ideas of faculty and program directors to generate options and chose to "develop faculty coaching" as the most promising way to make the positive impact. The research-based practices of educational coaching, Process Education concepts, and the seven principles of learning and persistence were creatively synthesized into a coaching method with the acronym ROCK-SOLID representing nine essential steps of coaching. Using the lens of Educational Design Research, the team incrementally explored meeting the needs of the institution, learners, and faculty for improved learning and persistence. All full- and part-time faculty at the university will complete the training by the end of 2023. Evaluation shows the uptake of coaching by faculty has been strong but that the new process/model has not had time to significantly impact grades, retention, and satisfaction. The experience shows the importance of building on research, testing implementations in the real-world, measuring results, learning what works, understanding why it works, and discovering needed improvements.

Introduction

An ongoing, multi-year project to improve learning and persistence involves the implementation of academic coaching at the University of Maryland Global Campus (UMGC). Beginning in 2018, the researcher-practitioners sought a combination of what would make a significant impact, as soon as possible. The team chose to implement academic coaching and has proceeded through a series of steps backed by incremental results. As of late 2022, full implementation through faculty training is underway. Projections are 2500 faculty successfully completing the training by the end of 2022 and nearly 4000 by the end of 2023.

Coaching as a concept may be grasped through training; to elevate to effective practice, coaching requires reflective application. Implementation will continue beyond training to help faculty develop their skills and to look for ways to improve the individual development and institutional implementation process.

Using the techniques of coaching effectively on a wide scale precedes any expected impacts on learning and retention. Of participating faculty surveyed by the summer of 2022, 23% said taking the coaching training impacted their teaching "a great deal," 33% said "a lot," and 29%, "some" for a total of 85%. No faculty reported that the course had not impacted their teaching. These results are shown in Figure 6.

As regards effectiveness, surveyed faculty who completed training rate themselves as excellent (20%) or good (68%) in using coaching, for a total of 88% of completers. A breakdown of specific practices in use by faculty is given in Figure 7 and shows generally high adoption, with the exception of self-coaching.

Having reached this success point in the implementation, the authors thought it important to analyze the progress made and the method of doing so for its potential value in providing insight to others doing similar research-to-implementation projects. The educational design research, (EDR), model of McKenny & Reeves (2018) usefully frames the project, helps to provide a common reference language, and serves to identify decisions and actions that promote success.

Developing training for academic coaching started with the ideas in Process Education's SII model of assessment for identifying and communicating strengths, improvements, and insights (Wasserman & Beyerlein, 2007). The model evolved over a four-year period, as the authors gained a better understanding of the needs of adult students and adjunct faculty in creating positive conditions and the skills needed to implement coaching. The result of multiple iterations is the ROCK SOLID Coaching Methodology.

The current status of the project is that completion of one or the other of the two coaching courses is required of all full and part-time faculty. Between February 2021 and September 2022, 1,871 faculty took the FacDev112 course and 1,633 demonstrated coaching competencies. A total of 1,091 faculty were registered for the course between September 2022 and December 2022. Based on the success

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rate of 87.28%, the combined actual completions are expected to total 2,582 faculty. Training will continue in 2023 until all faculty have completed the training. Faculty who do not initially pass may retake the training until they do.

The background begins with a review of the current evolution of academic coaching at UMGC, which is mnemonically referred to as the ROCK-SOLID Coaching Methodology or RSCM. The background continues with a more detailed history of the project and is followed by a brief summary of EDR. The narrative continues with a review of related research, both within Process Education and from many other sources that were drawn into the project to support the evolution of the RSCM. The methods section describes the mapping of the project onto the EDR framework, which highlights the practice and subsequent tests done during multiple iterations, each of which is a research project in itself. The results of each test are presented and then discussed. Discussion focuses on the importance of understanding and meeting stakeholder needs, design considerations, and process insights.

Background

The ROCK-SOLID Coaching Methodology (RSCM)

Academic coaching seeks to reinforce and build on the strengths demonstrated by a performer to improve future similar performances. An academic coach (hereafter, *coach*) does this by systematically developing feedback that is welcome, helpful, and impactful in the context of the performer. Coaching incorporates and extends the performance assessment and mentoring of Process Education and presents it as a memorable methodology.

The ROCK-SOLID Coaching Methodology describes one possible process of academic coaching that contains nine memorable steps applied in three phases. Figure 1 shows the three phases and the flow across the steps in each phase. Table 1 describes the phases and the steps taken during each phase. The methodology, as described in the table, may be used to provide feedback to individual and group performances. Each letter of ROCK-SOLID represents one of the nine steps in the methodology. The figure covers an ideal coaching situation where there is time to prepare, analyze, and then coach. In practice, the phases may happen in overlap or even simultaneously. For example, using ROCK-SOLID to coach a preplanned assignment proceeds sequentially through the three phases. On the other hand, a student may call a coach to discuss a grade, for example, but the coach determines it is best to start in the analyze phase by asking questions to understand, prepare, further analyze, and coach the student.

Table 1 provides a detailed explanation of each step of ROCK across the three phases. Table 2 does the same for each step of SOLID.

Figure 1 The Steps of the ROCK-SOLID Coaching Methodology Emphasized in Each Phase

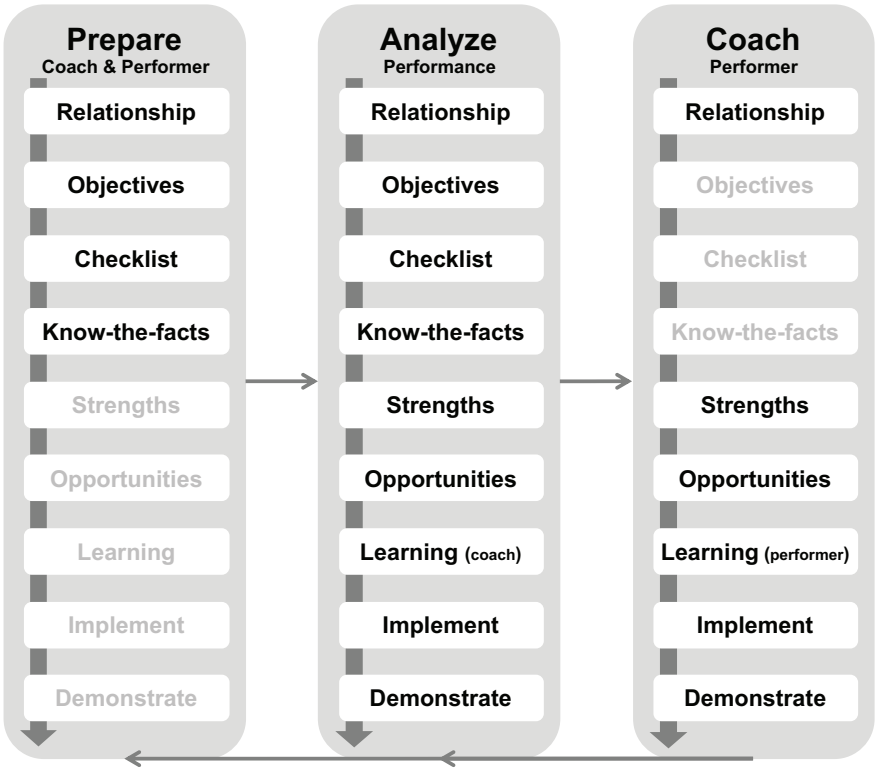


Table 1 Description of the Phases and Steps Within ROCK

Phases ↓	Prepare Coach & Performer	Analyze Performance	Coach Performer
	Prepare to analyze and coach; prepare individuals/teams to perform.	Measure, understand, and explain the individual/team's performance using evidence and preparations.	Provide guidance to improve future performances by the individual(s).
	Steps to take at each phase		
R **relationship**	Build relationships within the group of performers.	Using knowledge developed from the relationship, understand each individual's contribution to the performance, including prior knowledge, skills, and personal factors.	Prepare the performer to receive the feedback by being non-judgmental and appreciative of the effort required; affirm the purpose is to improve future performance.
O **objective**	Set the objective of the coaching based on the performance.	Focus on the performance within the scope of the objectives.	Remind the performer of the objectives to refresh the frame for the feedback.
C **checklist**	The checklist determines the dimensions of a quality performance and may also include measurement levels.	Apply the checklist to the performance and its results to determine the overall level of quality and its contributing factors.	Discuss the checklist measures within the strengths and opportunities.
K **know the facts**	Determine what information about a performance will be the most helpful.	Obtain evidence to analyze a specific performance to determine the process and skills that produced the observed quality.	Use the facts in the feedback so the performer can identify its context.

History of the Project

In 2018, one of the authors was engaged by UMGC to identify opportunities for improving educational outcomes. A formal report was issued on the value of the competency-based learning approach developed by UMGC known as the enhanced learning model (ELM). Among the findings of the 2019 report were barriers to quickly expanding ELM to broad implementation outside of the graduate program, mainly the cost and time required. These barriers led the consultant, the provost, and the vice president of Faculty Affairs to discuss other ways to enhance learning, the value of online experience, and persistence of students that would also lend themselves to being more affordably and expeditiously implemented. The team determined that the greatest and most immediate impact would come from academic coaching, which had been developed and later revised as an approach by Leasure (2019).

The long-term goals for this project, paraphrased from the 2019 project charter, are:

1. Develop an effective methodology for coaching that improves student learning and persistence
2. The method is usable by adjuncts
3. The method is scalable to all faculty within the university (~4,000)

Figures 2 and 3 depict significant project milestones that are further described in this section. Additional information on PACE and FacDev 111, including research results, appears in a paper by Leasure et al. (2020).

In spring 2019, UMGC began developing PACE 111, a new first-term undergraduate course with the design goal of enhancing motivation and persistence. Leasure and Günther proposed a parallel course, FACDEV 111, to train faculty teaching PACE 111. Erica Ellsworth, Marsha Fortney of the Faculty Affairs department, and David Leasure developed the course and taught it during the summer of 2019 to prepare faculty teaching PACE 111 in the fall of 2019. They revised the course at the end of summer based on their experiences together with faculty performance and feedback.

A coaching methodology, referred to as SOLID, guided the coaching portion of FacDev 111. SOLID combined concepts from Process Education that were developed and proven through twenty-five years of research (Apple et al., 2016). Each letter in SOLID stands for a step in the

coaching methodology to serve as a mnemonic: Strengths, Opportunities, Learning, Implementation, and Demonstration. The definition of each step has remained the same with the exception of learning, which expanded. The ROCK steps were added later. Table 2 describes the steps in SOLID.

Both SOLID and ROCK-SOLID share the goal of generating feedback that is welcomed and maximally impactful. Providing feedback that is not welcomed may have the unintended impact of demotivating the performer. When the performer welcomes the feedback, they make an effort to understand the feedback and how to implement its opportunities. The opportunities, rather than identifying the weaknesses, instead focus on the most impactful changes that can be made to improve future quality. It embeds the philosophy that even a strong performance may be made stronger.

Leasure and other members of the team reported on research conducted to determine the success of the PACE 111 and FACDEV 111 courses (2020). PACE 111 outperformed other courses in retention and grades, and more significantly, impacted student and faculty perceptions of learning.

Based on this success, Leasure and Günther decided to develop a version of FACDEV 111 for all UMGC faculty called FACDEV 112. Leasure and Fortney had both joined the First-term Experience department as collegiate faculty and developed FACDEV 112 in the fall of 2020. SOLID continued to be in the course based on the positive use by faculty. Since the SOLID had been primarily used for helping students solve challenges that could impede or derail their success in college, to be useful for all faculty, courses, and program levels, the coaching method needed to extend to giving feedback on student work and still work well for coaching students as they solved their problems.

Table 2 Description of the Phases and Steps within SOLID

Phases ↓	Prepare Coach & Performer	Analyze Performance	Coach Performer
	Prepare to analyze and coach; prepare individuals/teams to perform.	Measure, understand, and explain the individual/team's performance using evidence and preparations.	Provide guidance to improve future performances by the individual(s).
	Steps to take at each phase		
S **strengths**	Explain to the performers how the steps of SOLID coaching will be done, why they're important, the advantages of building on strengths vs. correcting deficiencies and how opportunities will be given for all performances.	Let quality measures guide strength identification; for each strength, consider how it was done and how it could be improved.	Identify 2-3 most impactful strengths, including skills, values, actions, & mindsets. Describe how to repeat for a future performance.
O **opportunities**		Where could changes to the process most improve the quality of future performances & within capability to grow by the performer.	Identify 2-3 opportunities to improve the future quality of the same or similar performance. Be specific about what and how.
L **learning**		Adopt an open mind when analyzing a performance to discern the method and intent while not imposing one's own.	Describe how the performer's learning can be applied to valued areas such as career success.
I **implement learning**		Consider what supports for the opportunities can best support the development of this performer or group.	Provide or ask the performer for a plan to achieve the opportunities. Coach the plan to improve its chance of success.
D **demonstrate learning**		Determine a future performance or deliverable that supports verification of learning. It need not be the same as the current one, but one that requires the skills to demonstrate.	Demonstrate confidence that the performer will be able to achieve the opportunities and determine when and how the performer will demonstrate the improvements.

An article reporting on the course success explains how PACE 111 incorporates seven principles of learning and persistence in its design that are not explicitly covered in FacDev 111 (Leasure, Blaher, et al., 2020). Table 3 lists these principles which Joe Cuseo (2018) presented in a talk and Dan Apple et al. documented with respect to Process Education in a paper (2020). These principles and the authors' experiences with teaching FacDev 111 led to a decision to equally emphasize relationship development, the setting of coaching objectives, the development of a checklist of quality, and a process to know the facts of a performance. These four elements became known as *ROCK* and joined with SOLID to produce the ROCK-SOLID Coaching Methodology.

PACE 111 contains discussions, curriculum, and one-on-one faculty meetings to build a trusting, supportive relationship between the faculty and students. FacDev 111 addresses building relationships in the faculty intro video section, but otherwise it is not explicitly linked to coaching.

Educational Design Research (EDR)

Susan McKenny and Thomas Reeves describe EDR in a comprehensive text on the subject:

> Education design research blends scientific investigation with systematic development and implementation of solutions to educational problems. Empirical investigation is conducted in real learning settings – not laboratories – to craft usable and effective solutions. At the same time, the research is carefully structured to produce theoretical understanding that can serve the work of others. (McKenney & Reeves, 2018)

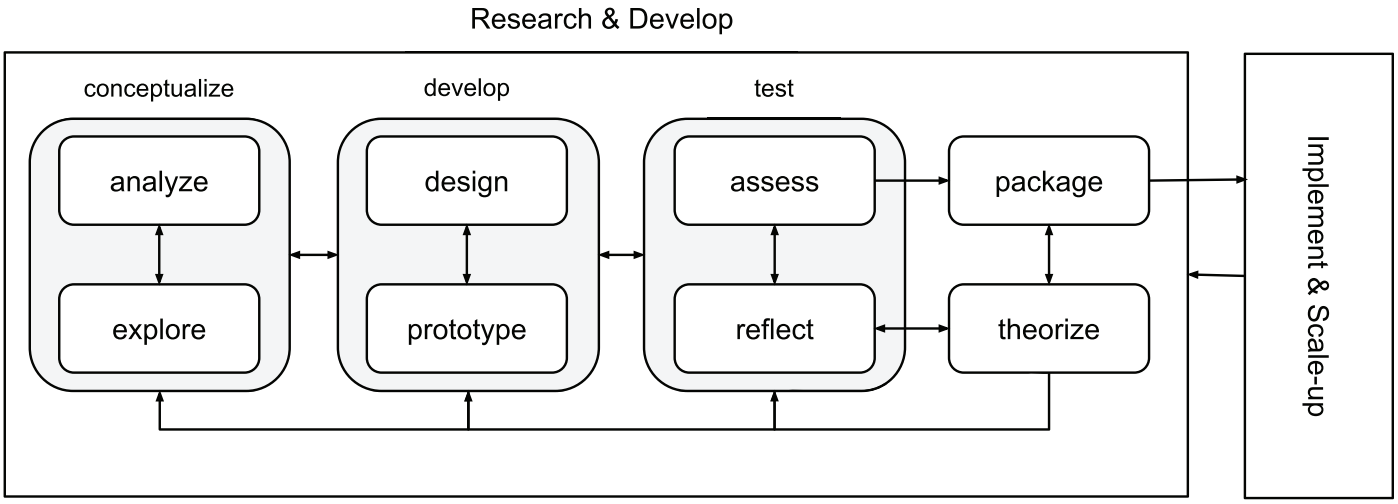
The work described in this paper meets this definition of EDR. The project has been systematically executed and studied in the real-world setting of UMGC.

Figure 2 depicts the phases and steps in EDR, modeled after McKenny's and Reeve's process for EDR. EDR may be regarded as a schema because the steps are non-sequential and optional in practice. This schema is used in the Results

Table 3 Principles of Learning and Persistence and Their Use in ROCK-SOLID

Learning and Persistence	Incorporation in ROCK-SOLID
Personal Validation	Validation of individuals, as being capable and contributing to the university community, occurs in the initial establishment of a relationship (R) and reinforced in each coaching feedback session.
Self-Efficacy, Growth Mindset, and Grit	Identifying strengths (S) helps a student recognize their capabilities in performing collegiate-level work. Growth mindset is inherent in the coaching method which seeks to improve future performance and not judge past performances. Coaches encourage grit when expressing confidence in students during feedback. The checklist (C) helps students self-regulate their learning and make decisions about the quality of their work.
Meaning and Purpose	Feedback, especially leveraging learning (L), reinforces that the learning empowers what the performer cares about, usually being able to see the value to one's career. Originally, (L) stood for Learning Insights, but it was ambiguous whose learning was highlighted and why it mattered. Opportunities (O) are suggested by coaches not just to improve the current performance but to broaden the application of skills to similar areas.
Active Involvement (Engagement)	Students who build their own implementation plans, (I), take active ownership of their learning and performance. Self and peer coaching likewise provide active learning and encourage development of learning ownership.
Reflection and Metacognition	Self-coaching encourages metacognition when a performance's process is analyzed with know-the-facts (K). The mental process is reviewed and improved during coaching. Reflection appears in finding the meaning of an experience, as shows up when leveraging learning (L).
Social Integration	Coaching can reinforce other social processes, such as collaborative and cooperative learning, peer coaching, and when coaching the application of social and relationship skills in team projects.
Self-Awareness/ Self-Knowledge	Students reflect on values and how they live them as well as other cares they have when performing self-coaching, as they must think about the objectives of coaching (O), the construction of a checklist (C) and the reflection required when doing know-the-facts (K).

Figure 2 Conventional Educational Design Research (EDR) Schema



and Discussion sections to guide a rational reconstruction of the project. The actual project details are extensive and the paper benefits from this abstraction.

Reporting on an EDR project can be difficult. McKenny and Reeves list two challenges: having "too much story to tell" and the difficulty achieving "alignment with standardized research reports" (2018). Indeed, in a project spanning multiple years and touching thousands of people, the story is large.

A value of using the EDR framework is to present recognizable phases and steps with comparable terminology so that an implementation done by one group may be compared with another's. In addition, each transition from one phase to another represents a decision, ideally supported by a test, that provides guidance to the transition.

Review of Related Research

As the coaching project evolved, additional sources of research contributed to the evolving methodology, course, and change approach. Tables 4, 5, 6a, 6b, and 7 list the key concepts by area along with citations to the research. Entries with "PE:" represent sources within the Process Education community. All other reference concepts lack this prefix.

Table 4 Summary of Prior Research on Learning and Persistence Applied in this Work

Concept	Research Support
Learning and Persistence	
7 timeless and universal principles	(Apple et al., 2020; Cuseo, 2018) is explicitly covered in the FACDEV 112 course.
PE: Quality learning environments	(Apple et al., 2016; Apple & Smith, 2007) contributed to the method to build relationships and establish trust.
PE: Assessment Mindset	(Jensen, 2007) contributes the emphasis on improving future performances rather than judging the past performance.
Learning Skills	
PE: Classification of Learning Skills	(Leise et al., 2019) contributes the focus of coaching the learning skills that produced the performance rather than the end product as well as offering suggestions coaches could apply.
PE: Learning to Learn	(Apple et al., 2013) also contributes to the idea that the skills for learning are a more effective target for coaching as they will affect many future performances.
PE: Psychology of Learning and Success	(Apple, 2017) demonstrated the power of coaching to support students' development into more capable performers and provided conceptual support for selecting the coaching project.

Table 5 Summary of Prior Research on Coaching Applied in this Work

Concept	Research Support
Person-Centered Education	
PE: Risk factors for success	(Horton, 2015) lists the types of risks addressable through coaching.
PE: Risk and success frameworks	(Apple et al., 2018a, 2018b; Leasure & Apple, 2018) analyze how risk identification applies to success.
Coaching Process	
Coaching with the Brain in Mind	(Rock & Page, 2009) expands *assessing to improve performance* to include life coaching of desired criteria defined by the performer.
PE: Mentoring	(Apple et al., 2016, pp. 93–98; Leise, 2007) demonstrate skills and techniques used within coaching.
Differentiating Coaching from Grading: Evaluation vs. Assessment	
PE: Evaluation vs. Assessment	(Apple et al., 2016, pp. 51–58) contributes the distinction between performance coaching and performance evaluation incorporated into ROCK-SOLID.
Transformational vs Transmissive/ Transactional Feedback	(Miller & Seller, 1985) contributes the need to coach with a broader perspective supporting the growth of the individual and not only the objectives of the course.

Table 6a Summary of Prior Research Incorporated into ROCK Portion of the Coaching Methodology

Concept	Research Support
Relationship and Trust Building	
Trust building	(Covey & Merrill, 2006; Cuseo, 2018; Kegan & Lahey, 2000, 2016) support taking learning risks, enhancing the desire for coaching, using the language of authentic regard, and to enhance the desire to improve oneself.
PE: Quality learning environments	(Apple & Smith, 2007; Hintze-Yates et al., 2011; Smith & Apple, 2007) lists practical actions to take to create and sustain a productive learning atmosphere of coaching, facilitating, and evaluating.
Objectives for Coaching	
PE: Learning by performing (LxP)	(Leasure, Apple, et al., 2020) Integrates learning activities with coaching and evaluation to create productive learning and growth.
Checklist for Process and Product	
The Checklist Manifesto	(Gawande, 2009) provides rationale for checklists.
PE: Performance descriptions	(Nelson et al., 2020) demonstrates powerful descriptions that foster greater aspirations by learners.
PE: Performance criteria and measurements	(Apple et al.) brings a methodology for creating and productively using criteria for coaching.
Know-the-Facts	
PE: Theory of Performance	(Elger, 2007) provides an easily applied framework for analyzing the conditions leading to performance variation.
Learning by Performing (LXP)	(Leasure, Apple, et al., 2020) shows the importance of knowing the facts to better coach the learner to control for variation.

Table 6b Summary of Prior Research Incorporated into SOLID Portion of the Coaching Methodology

Strengths, Opportunities, Learning	
Concept	**Research Support**
PE: Assessment Strengths, Improvement, Insights	(Wasserman & Beyerlein, 2007) provides the foundation to SOL steps and rationale for identification of strengths first, followed by opportunity to improve. Emphasized the importance of the language of coaching to encourage change efforts and growth mindset.
PE: Growth and Learning to Learn	(Apple et al., 2016) demonstrates both coaching and self-coaching methodologies adapted to SOL steps and the importance of models and practices to support learning to coach.
Implementation, Demonstration	
PE: LxP	(Leasure, Apple, et al., 2020) discussed the importance and key elements of planning for learning success.
Wish, Objective, Obstacles, Plan	(Oettingen et al., 2015) contributes a tested approach to creating effective plans.
The Language of Coaching	
The language of authentic regard; The language of deconstructive feedback	(Kegan & Lahey, 2000) contribute patterns and mindsets to achieve non-judgmental and authentic language that enhances personal change.
PE: Mindset for Assessment	(Jensen, 2007) describes the coaching mindset for achieving coaching that is welcome and impactful.

Table 7 Summary of Prior Research on Institutional Change Applied in this Work

Concept	Research Support
Organizational Change	(Preston & Armstrong, 1991; Schein, 1996, 2010) demonstrate the importance of addressing professors' motivation to adopt coaching for their own benefit, such as being more effective, making a greater impact, and promoting persistence. Schein in particular suggests aligning the cultural incentives.
Development and Implementation	(Kotter, 2007; McKenney & Reeves, 2018; Pilcher, 2010) provide advice on avoiding failure, ensuring success, and taking a structured, incremental approach to change with multiple testing points. McKenny & Reeves provide the language and structuring of EDR to support agile, tested development.
Iterative Process Improvement	(Langley et al., 2009) provides a summary and comprehensive reference for the techniques of quality improvement that were used throughout the process.

Methods

Given the complexity of an EDR-based project, the time frame is long, the tests and decisions are many, and the methods vary with the needs of the situation. The research for this paper focuses on these three main areas, each explained in a subsection.

1. Mapping the project onto EDR phases
2. Testing at key points
3. Extracting process and other knowledge useful when implementing large-scale change

Project Mapping to EDR

Mapping the history of the project to EDR steps supports the third focus area of extracting useful process knowledge. To create the map, the project history is assigned to the EDR phases and steps depicted in Figure 2. The resulting map is presented in Figures 3 and 4 which are presented in the Results section. Figures 3 and 4 clarify the subprojects that build knowledge and experience, highlighting the tests that inform key decisions, both for continuation of the project and for adapting to the specific environment and culture.

Testing at Key Points

The EDR process conducts tests to decide whether to move forward, revisit a prior step, or stop the project. In addition, these tests support reflection and theory-development steps within EDR. The specific tests that follow inform the implementation. To assist understanding, each test is identified with the step number as depicted in Figures 3 and 4.

- **Analyze the educational approaches of the University (Steps 2-4, Figure 3)**

  Conduct through interviews and synthesis of key points within them. Particular attention to be given to strengths and opportunities to support proposals that would improve learning and persistence at the university.

- **Pilot and review of faculty results from the FACDEV 111 course (Steps 6-8, Figure 3)**

  This test reviews the instructor feedback, performance on the in-class projects, and a reflection session among the instructors with the leaders of Faculty Affairs and Faculty Development.

- **PACE 111 Success review (Steps 12 and 15, Figure 3)**

  The first goal of the test is to validate that the training and delivery of academic coaching through the PACE 111 course makes an impact. The second goal was to collect information that would guide the generalization of FACDEV 111 into FACDEV 112.

  The method and results of this test are documented in a paper by Leasure, Blaher, et al. (2020) and summarized in the Results section.

- **Review the pilot offerings of FACDEV 112 (Steps 19-21, Figure 4)**

  The testers will assess the learner's assignments, including pre- and post-course statements of teaching philosophy, coaching of peers, written coaching of student work, demonstration of the language of coaching, and commitment and practicality of their coaching implementation plan.

  The test supports identification of needed refinements, evaluation of course outcomes, acceptance of the course by faculty, identification of faculty to lead future sections of the course, and whether to present the course to the provost for the decision to fully implement for all faculty at UMGC.

- **Assess and address stakeholder feedback (Steps 25-28, Figure 4)**

  Perform grounded theory research methods to the learners' coaching implementation plans produced in the first non-pilot sections of FACDEV 112 to identify impediments to implementation of coaching.

  Within FACDEV 112, all faculty create coaching implementation plans that capture intention, actions, and expected obstacles. The plans are based on the successful WOOP approach suggested by Oetinngen et al. (2015).

- **Intent to coach (Steps 30-31, Figure 4)**

  Perform qualitative analysis of learners' teaching philosophy, produced at the end of the FACDEV 112 course, to determine the percentage of faculty who are or will use coaching in their courses.

- **Evaluate effects of FACDEV 112 on student and faculty metrics (Steps 34-35, Figure 4)**

  Perform comparative analysis between the treatment (faculty completing FACDEV 112 and their students) and the control groups (faculty who did not complete FACDEV 112 and their students) to determine the effects on the following:

  - student perception of faculty engagement and performance by using end-of-course surveys
  - student performance and persistence by using course completion and persistence rates
  - faculty perception of the helpfulness of the FACDEV 112 course by using a specific survey

Generalizing the Results

EDR mapping enables generalizing design and implementation knowledge in regard to phase transitions. The Reflection Methodology (Desjarlais & Smith, 2011) applies well to the experiences. Table 8 lists focus questions to guide the reflection; these have been adapted from the author guidelines of the academic journal, *Educational Designer* (2021).

Table 8 Focus Questions for Augmented Reflection

F1	What key premises, principles, heuristics or considerations, (expressed as generalized knowledge) of the design itself or the research and design / implementation process can contribute to future projects?
F2	What criteria for good design, from the perspectives of designers, clients and users, does the design achieve and why is it good?
F3	What design and development processes were followed, should be followed, or should not be followed?
F4	What is the connection to scholarly evidence for the insights?

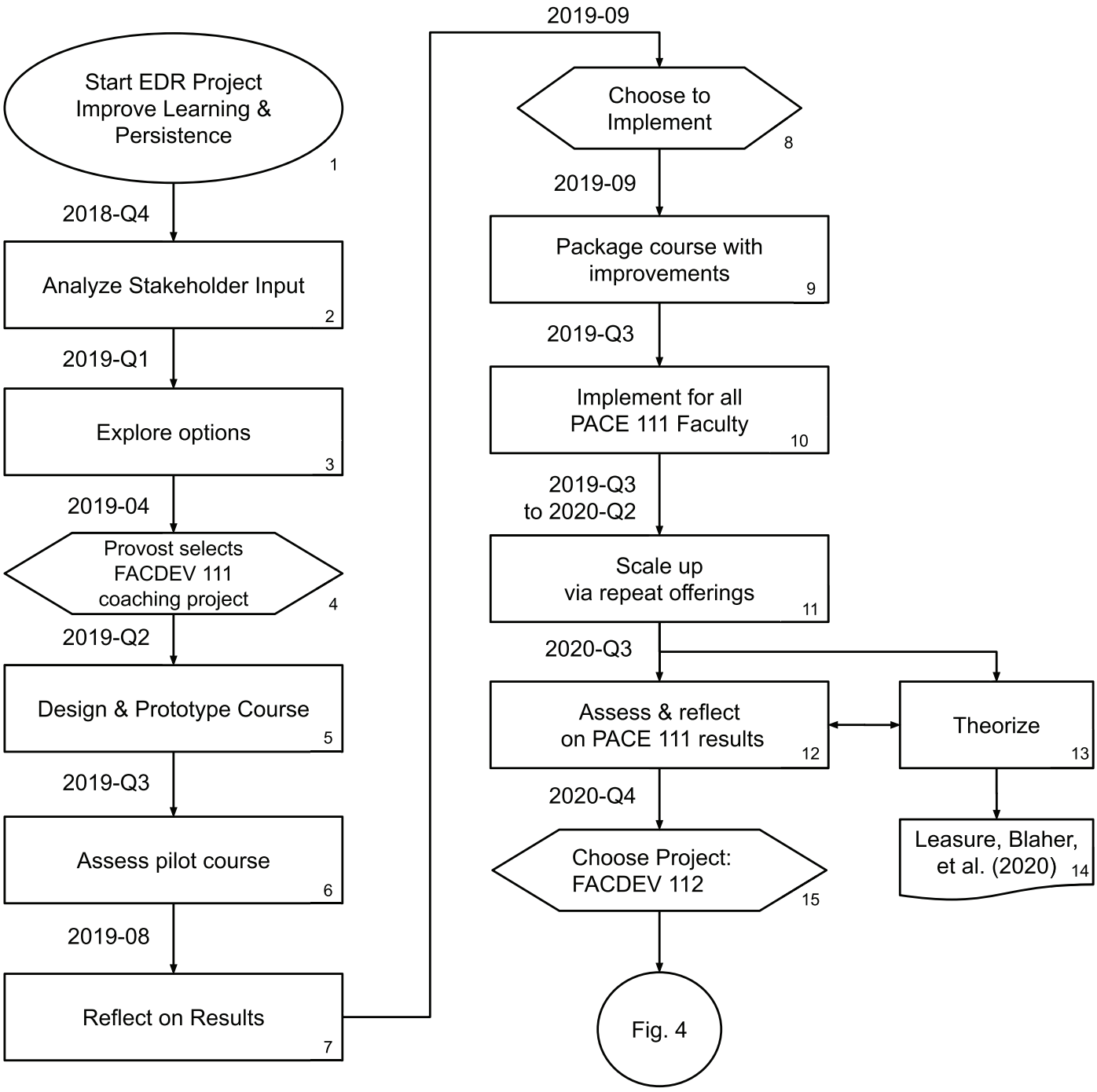
Results

Mapping the Project to EDR

The EDR approach depicted in Figure 2 uses two-way arrows between phases and steps to imply that looping among or even jumping between steps may occur within the EDR process. This section captures the many steps and decisions that occurred in the project and presents them in the language of EDR. Again, Figures 3 and 4 depict the mapping of the project phases with the steps taken. These steps are numbered for ease of reference, both in the figures and the remainder of the Results section. The tests described in the Methods section are integrated as EDR steps that are not explicit in the schema of Figure 2, yet were key points in the direction and evolution of the project. Each of the 36 steps are explained.

1. The project began in late 2018 as an investigation of the educational approaches used at UMUC with the goal of improving learning and persistence, particularly investigating whether UMUC's competency-based approach, called the Enhanced Learning Model (ELM), could offer an advantage. One of the authors conducted interviews of more than 40 faculty and academic leaders.
2. The interviews were analyzed to produce a report for the Provost that subsequently presented the findings in six academic workshops to the academic team, gathering their feedback.
3. Following a positive reaction by workshop attendees, the Provost requested exploration of possible follow-up projects to improve learning and persistence in a substantive and timely way. A report listing 10 possible projects was produced. The projects ranged from changes in the way courses are developed to faculty development for different teaching interventions including active learning, expansion of competency based education, and academic coaching.
4. The provost reviewed the projects, and based on the speed that coaching could be developed and put to use by faculty, academic coaching was selected. In consultation with the Faculty Affairs department, it was decided to develop a faculty preparation course for the new PACE 111 first-term, undergraduate course. The FACDEV 111 project was initiated.
5. PACE 111 would be offered beginning in August 2019. The FACDEV 112 course was designed, built, and began to be delivered in the second quarter of 2019. The design adapted ideas from Process Education's approach to assessment of learning (Apple & Baehr, 2007; Baehr & Beyerlein, 2007; Jensen, 2007; Wasserman & Beyerlein, 2007). The adaptation removed confusion concerning the multiple definitions of *assessment* by referring to it as *coaching*. The resulting method, named SOLID, is an acronym for the steps coaches take: identify strengths (S), opportunities (O), a learning (L) the coach had from the student's work, an implementation plan (I) for improving future performances, and a demonstration date and means. The course instructors demonstrate (D) coaching through feedback on the faculty's coaching of one of six scenarios and the coaching of another faculty. The course also focused on creating a relationship up front with students via a course video.
6. Faculty were selected to teach the first PACE 111 sections and became the pilot group for FACDEV 111. Several of the authors taught multiple pilot sections beginning in the third quarter of 2019. Dynamic improvements were made to FACDEV 111 based on comments and questions received by the team. Faculty were able to complete the course in five days and embraced the academic coaching ideas. The course instructors met frequently to compare experiences.
7. The FACDEV 111 team reflected on the resulting coaching skills of the faculty taking the course, their embrace of the coaching approach, and the ability to continue to offer the course to new faculty.
8. The Faculty Affairs leadership reviewed the results and chose to move forward with full implementation of FACDEV 111.
9. The course was polished and somewhat streamlined for both instructors and students.
10. FACDEV 111 was reaffirmed as the pathway to qualify faculty to teach PACE 111.
11. As the number of sections of PACE 111 scaled up, so did the offering of FACDEV 111.
12. PACE was evaluated by the Institutional Research department after one year to determine its impact (this is discussed in the Results from Tests subsection).
13. Research on student learning and persistence revealed seven principles of learning and persistence, e.g., Apple et al. (2020), that are embedded in the design of PACE 111 and reinforced by coaching. This work demonstrated how the theory of coaching and the principles interacted to support the results. Theorizing explained the importance of relationship building, and the need for it to occur with students from the beginning through to the end of a course experience.
14. The research results for PACE 111 and FACDEV 111 courses are documented by Leasure, Blaher, et al. (2020).
15. The demonstrated success of PACE 111 led the Faculty Affairs team to approve a coaching course for all faculty, designated the FACDEV 112 Project.

Figure 3 The Mapping of the "Improve Learning and Persistence Project" to EDR Steps, Part 1.



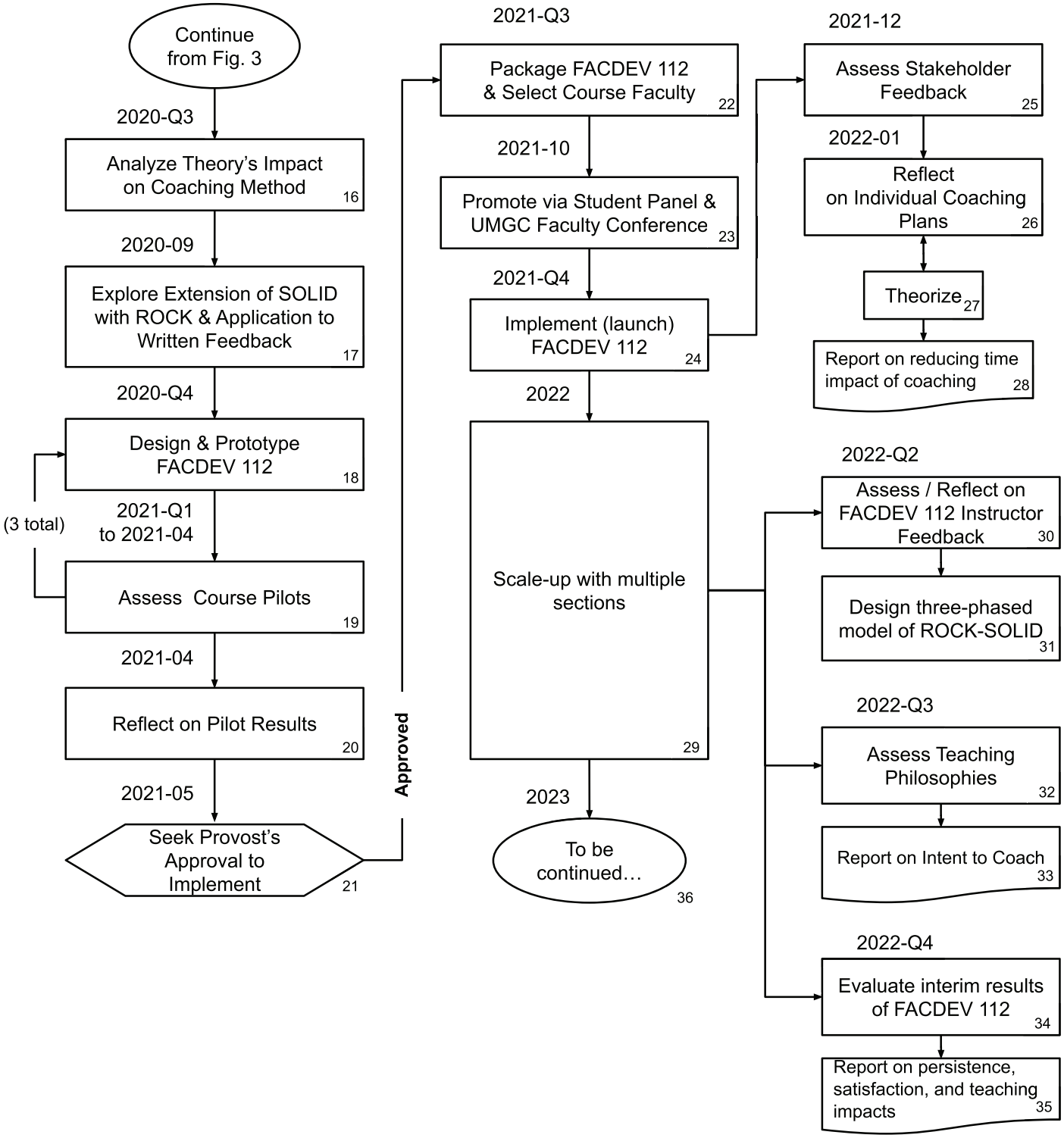
The following Steps, 16-31, are depicted in Figure 4.

16. The key extensions from FACDEV 111 to the future FACDEV 112 are the generalization of coaching to both assignment coaching and the coaching of students' problem solving of non-curricular impediments and adding the missing features of FACDEV 111 that are found in the structure of PACE 111. The analysis of PACE 111 showed that the seven principles contributing to learning and persistence would help FACDEV 112 be more impactful. The need for effective coaching of learning through assignments also would ensure the applicability of FACDEV 112.
17. The team explored the incorporation of these principles into coaching while preserving the mnemonic benefit of an acronym capturing the steps. After much discussion, the team adopted ROCK-SOLID as the approach, where ROCK stands for Relationship, Objectives, Checklist, and Know-the facts. The mapping of the principles into ROCK-SOLID is described in Table 3.
18. Three iterations of design and prototype coupled with pilot testing (Step 19) refined the design of FACDEV 112. The first design focused on adding the new features to FACDEV 111 and video components supporting all of ROCK-SOLID. Subsequent designs included explicit coverage of the principles and an adaptation of Kegan & Lahey's (2000) languages of authentic regard and deconstructive criticism to a language of coaching.
19. Assessment of the three pilots used the deliverables of faculty-trainees to gauge the mindset and competency changes occurring in the course with respect to the goal of a motivated, caring faculty with the skills to address individual differences of students and the ability to adapt coaching to the full variety of course structures.
20. In reflecting on the course results, including the assessment of Step 19, the team and its leaders assessed how the course experience was perceived by stakeholder-faculty taking the course and their managers. Importantly, they also identified faculty who exemplified the best of coaching within the course to serve as future course trainers, should the course go forward.
21. Considering the positive results of the assessment and reflection and the ability to scale, Faculty Affairs decided to present the course to the provost for approval. After reviewing the course materials and plan, the provost approved implementation for all UMGC full and part-time faculty.
22. The course was packaged by instantiating the course model to multiple sections and a compensation model was developed for faculty teaching the course.
23. To prepare faculty for a change in their role from grading to coaching plus grading, Faculty Affairs made coaching and mentoring the theme of the fall 2021 Faculty Conference. To build energy, Faculty Affairs hosted a zoom panel composed of students who had nominated their favorite professors for teaching awards. The theme of the panel was to describe great teaching. Much of it paralleled coaching and the seven principles.
24. Faculty development implemented FACDEV 112 on November 11, 2021, offering five sections, each lasting two weeks.
25. Faculty Affairs collected feedback from program directors who voiced concerns of some of their faculty. The primary lament was a concern for the amount of time coaching would take over current workload for a course. The feeling was broad enough to trigger a reflection.
26. The team assembled and reflected on the coaching implementation plans of the first 75 faculty completing FACDEV 112.
27. Grounded theory research process was applied to analyze the implementation plans and develop a practical theory for approaching the time-to-coach obstacle.
28. A report was produced for Faculty Affairs to use in communicating with stakeholders.
29. Faculty Development fielded a total of 82 sections of FACDEV 112 between November 29, 2021 and July 27, 2022, with more on the 2022 schedule.
30. In the Microsoft Teams channel for FACDEV 112, instructors discussed the difficulty some students were having in FACDEV 112 applying ROCK-SOLID to different course models. They needed a model that would minimize duplicated effort and better explain how to prepare to coach in varying courses.

A second question arose concerning the L in SOLID. Its meaning in FACDEV 111 was to give appreciation to the performer for what the coach had learned (L) from them. The desire by program directors was to connect the learning done by the performer to the goals of the performer, thereby activate the purpose principle. The original intent was preserved in how the coach keeps an open mind during analysis and can give thanks to the performer while making the new connections that sustain motivation.

31. The team developed a new design that introduced three phases of using ROCK-SOLID. The new design emphasizes the planning, analysis, and giving of feedback to a performer and is depicted in Figure 1 and described in Table 3.

Figure 4 The Mapping of the "Improve Learning and Persistence Project" to EDR Steps, Part 2.



32. A spot check on the impact of FACDEV 112 on the post-course philosophies of completers revealed a high proportion of intention to implement coaching in their future teaching practice.
33. The report on the intent to coach is presented later in the Results section.
34. The Academic Quality department of UMGC initiated an interim study in the fall of 2022 to determine the effects FACDEV 112 may have on teaching at UMGC.
35. The department issued an internal report authored by Patch (2022) that shows use of coaching practices and impacts on personal approaches to teaching and iden-

tifies the opportunity to improve the impact of coaching on persistence and end-of-course satisfaction. The report supports continued investigation into the implementation of coaching by faculty after completing FACDEV 112.

36. Faculty development anticipates continued offering of an updated FACDEV 112 in 2023. The updates will incorporate the results of Step 31 and the version of RSCM depicted in Figure 1.

This mapping demonstrates that the EDR schema has been successfully applied in this case to classify the steps taken in the project. The resulting mapping (classification) aids in understanding the evolution of the project, especially due to the influence on project evolution from the tests and assess/theorize steps.

- **Analysis the Educational Approaches of the University (Steps 2-4, Figure 3)**

  To analyze the approaches, a combination of interviews and review of existing educational documents were analyzed. Over 40 interviews were conducted with faculty, program directors, and deans of the university. Much of the discussion was about how to produce new programs faster, but other initiatives in this area were already underway. Another possibility for an initiative included injecting more active learning into the curriculum but would require extensive revision of curriculum. It was determined that faculty training offered the most effective parallel activity to curriculum development and development processes. After discussion, the most widespread approach for impact was determined to be academic coaching.

- **Review of the Pilot and Faculty Results in FACDEV 111 (Steps 6-8, Figure 3)**

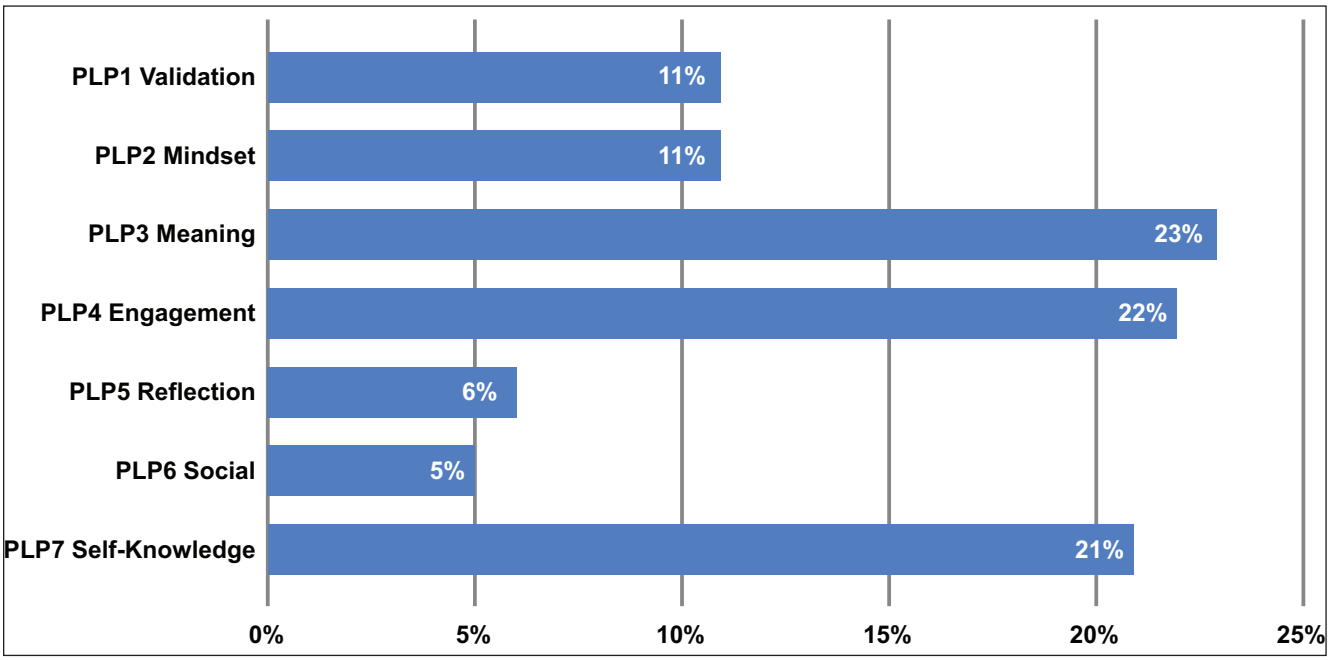
  PACE 111 showed improved satisfaction and persistence over other first-term courses. It had higher success rates (fall 2019 n = 4000, spring 2020 n = 5280, resp.) of 78.5% and 82.7% compared to rates in other first-term courses of writing, information systems, and psychology (fall 2019 n = 6428, spring 2020 n = 6431, resp.) of 74.2% and 77.9%. Digging deeper through qualitative analysis of student comments showed that 72% of the respondents (a total of 898) identified, as part of their experience, one or more of the seven principles of learning and persistence and summarized in Figure 5. More detailed results are contained in the paper by Leasure, Blaher, et al. (2020).

- **Review of the PACE 111 Success (Steps 12-15, Figure 3, and Steps 16 and 17, Figure 4)**

  This test, as described in the methods, consisted of comparing PACE 111 students' retention rates and satisfaction levels to those in other first-year courses. It also reviewed faculty satisfaction and compared it to UMGC-wide satisfaction. Students' free form comments were collected and analyzed.

  The results of the PACE 111 assessment provide indirect evidence of the value of FACDEV 111. The method and results of this test are documented in a paper by

Figure 5 Observed Frequency of the Seven Principles of Learning and Persistence in Student Surveys from PACE 111, 2020-Q2, n=650. Adapted from Table 2 of Leasure, Blaher, et al. (2020).



Leasure, Blaher, et al. (2020) which reports that students had higher retention than other first term courses as well as greater satisfaction and that faculty had higher teaching satisfaction as well. In addition, the team compared the principles in PACE with seven principles of learning and persistence (Apple et al., 2020; Cuseo, 2018) and found a close alignment between the two. This alignment was corroborated by qualitative analysis of free-form comments from 650 students that coded to one or more of the principles; the frequency of response is shown in Figure 5.

Faculty Affairs reflected on the results of the test and alignment with theory, consulted with the trainers and course developers for FACDEV 111, and decided to approve a project to create FACDEV 112 by generalizing and enhancing FACDEV 111. The new project would be piloted, and if successful, offered to all faculty at UMGC to help them use coaching effectively within their courses to impact learning and persistence.

Two authors revised the SOLID approach of FACDEV 111 to the ROCK-SOLID approach of FACDEV 112. The resulting design includes four new steps in coaching called ROCK that are defined in Table 1. The design also explicitly uses the coaching steps to support the seven principles.

- **Reviewing the Pilot Offerings of FACDEV 112 (Steps 19-21, Figure 4)**

  Three pilots of FACDEV 112 were fielded and assessed. The first two pilots launched in 2021-02 and emphasized the delivery of coaching with written feedback while not covering coaching of students' problem solving of personal situations. The third pilot launched in 2022-04 and incorporated both approaches to coaching and the explicit use of coaching to support principles of learning and persistence.

  Faculty were invited to participate in the three pilots and 55 accepted the invitation. 12 performed so well that they were recommended to teach future offerings of FACDEV 112.

  The experience and feedback from the three pilots led to enhancements to improve the quality of the course, reduce confusion, and reduce the time to complete. The reviewers assessed the quality of learners' work, including pre- and post-course statements of teaching philosophy, coaching of peers, written coaching of student work, demonstration of the language of coaching, commitment to coaching, and practicality of students' coaching implementation plans.

  The team felt the pilots were a success based on multiple criteria. The course was judged effective because the students demonstrated coaching skill, a change in their philosophy that incorporated coaching, and wrote plans to apply coaching to a variety of courses. The course was judged engaging because of the volume of voluntary reflective discussion of their experiences and the enthusiasm expressed in their surveys and teaching philosophies. Efficiency was partially established with the finding that the course took a total of 8-10 hours of student effort. The team determined implementability of the course by the confirmation of efficacy and engagement, a plan to improve the course's efficiency, and the availability and enthusiasm of the recommended instructors.

  Faculty Affairs reflected on the results of the assessment, consulted with the instructor of the pilot, examined student work, confirmed readiness of the team to implement for all faculty, and ensured sufficient staff to administer enrollments and record keeping. Faculty Affairs approved submitting the course for approval by the new provost and her team.

  The provost approved the implementation of RSCM training for all faculty and the team began preparation for implementation and scale-up, which started in November, 2021.

- **Assessing Stakeholder Feedback (Steps 25-28, Figure 4) Winter 2021**

  After the first five offerings of FACDEV 112, Faculty Affairs met with UMGC's program directors who explained a concern that coaching would take too long for faculty to execute in their courses. The seriousness of this concern led to an unplanned assessment of FACDEV 112 with the research question to discover methods that would allow faculty to efficiently apply coaching that they judged usable.

  One of the authors applied the grounded theory approach of Glaser and Strauss (1967) to seventy-five coaching implementation plans from the first five sections of FACDEV 112. Within FACDEV 112, all faculty create coaching implementation plans that capture intention, actions, and expected obstacles. Grounded theory induces theories that the producers of the analyzed data would agree with. The assignment specifies plans following the WOOP approach suggested by Oetinngen et al. (2015). Students, in their plans, identify the benefits of coaching to them, describe the immediate outcome that results from successful implementation of the plan, list the obstacles that could prevent success, and present their strategies to address the obstacles, when encountered.

The plans described 239 obstacles, each with one or more strategies to use if that obstacle were to appear. The most frequently mentioned obstacle at 21% was that "coaching may take too much time", which confirmed the concern of the program directors. The second most frequent obstacle mentioned, at 16%, was "not having control over the course structure would limit coaching opportunities". Importantly, rather than accepting these obstacles, faculty proposed solution strategies. For the first obstacle of limited time, faculty produced 131 overlapping solutions that fell into 25 solution categories which were then synthesized into seven solutions covering 94% of the approaches. Overall, while faculty recognized the potential of time challenges associated with coaching, they also saw the value of coaching, the incremental addition of time to grading they are already doing, and saw the suggestions produced as ways to overcome these limitations.

A list of these solutions follows:

- Reduce the need to coach the most frequent errors of students. The errors included not following assignment instructions, mismanagement of time, procrastination, insufficient preparation, poor self-motivation, poor engagement, failure to read and act on feedback, and not consulting the faculty with students' difficulties.

  The recommended solutions include early action on any challenges, relationship building, connecting to real-world outcomes, strengthening student communication, and describing time management skills.
- Prioritize coaching among the teaching responsibilities as an effective way to improve learning; to allocate time appropriately, consult with experienced faculty to determine the most important.
- Target coaching to the assignments where students struggle to learn the most important concepts; faculty may also refer students who struggle individually to tutoring or the writing center.
- Practice to become more efficient; the most helpful strategies include use of a quality checklist for the coaching process, timing coaching per assignment and self-coaching to improve, performing group coaching that applies to most students, and keeping a clip-file of common feedback phrases for each assignment.
- Selectively coach the students who need it the most.
- Coach as close to the performance/assignment as possible to take advantage of the students' momentum and higher likelihood of using the feedback; this reduces re-coaching of the same situations.
- Provide mutual support for improving the practice of coaching.

The report showed stakeholders that they were heard and that there are multiple strategies for reducing coaching time that preserve the value of coaching.

- **Assessing Teaching Philosophy Statements for the Intent to Coach (Steps 32-33, Figure 4)**

  Faculty in the first course offerings showed an intent to coach by stating such in their plans. The final teaching philosophies developed in the course provide a second validation of the intent to coach, and this time were taken from 200 faculty who took the course in June 2022 through July 2022. Qualitative coding of the intent to coach involved looking for evidence in their statements directly related to a positive use of coaching with students.

  The analysis shows that of the 200 philosophy statements, 84.5% made explicit and positive reference to coaching students, 1.5% described not wanting to use coaching, and the remaining 14% did not provide enough evidence to code either way.

- **Evaluating Impacts of FACDEV 112 on Key Metrics and Faculty Adoption (Steps 34-35, Figure 4)**

  In the fall of 2022, after a sufficient number of faculty had completed FACDEV 112, UMGC's Institutional Research department evaluated the effects of this course on the student perception of faculty engagement and performance, student performance and persistence, and faculty perception of the helpfulness of the FACDEV 112 course.

  Statistical analysis of the results of data supporting these questions yielded the following:

  - Faculty ratings in the end-of-course surveys were not statistically significantly different in the post-FACDEV 112 courses as compared with their pre-FACDEV 112 scores
  - The success and persistence rates were not statistically significantly different between the pre- and post-FACDEV 112 courses
  - Faculty had a great experience with FACDEV 112 and reported a positive impact on their teaching

  Since the first two inquiries displayed no statistically significant effects, Figures 6, 7, and 8 reflect only the impact on faculty teaching practices. A change in practice is expected to precede a change in downstream metrics.

Figure 6 Reported Overall Impact of FacDev112 on Teaching, 2022-Q2, n = 82

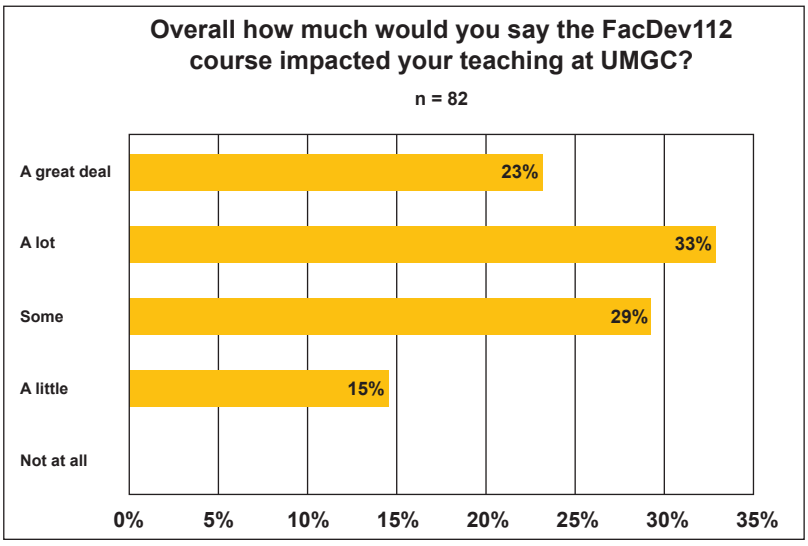


Figure 7 Reported Use of Coaching Practices, 2022-Q2, n = 52

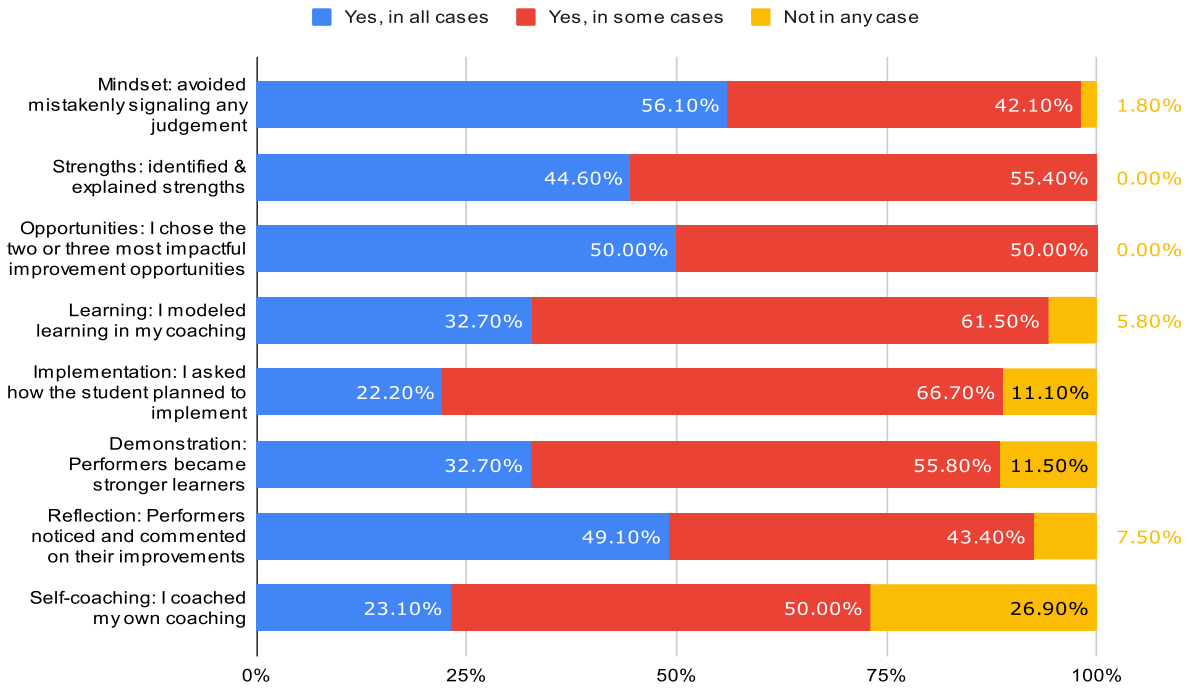
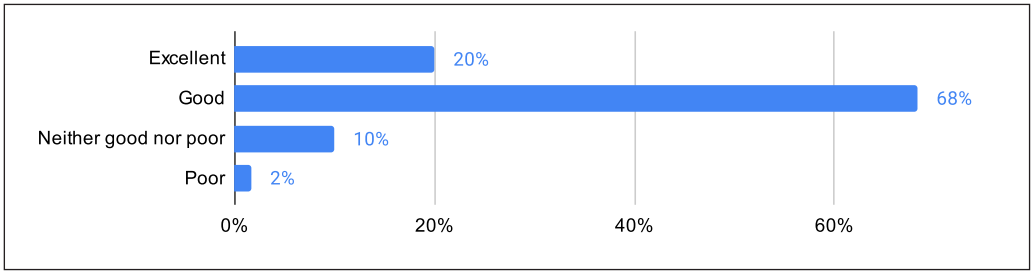


Figure 8 Self-Rating of Coaching Performance, 2022-Q2, n = 60



Discussion

The four EDR focus questions listed in Table 8 provide a framework for generalizing the results. Each question appears as a subsection: Stakeholder Focus (F2), Design (F1), and Process Insights (F3). Answers to the fourth focus question, Scholarly Support (F4), are addressed where needed throughout the paper.

Stakeholder Focus (F2)

The success or failure of initiatives rests on acceptance by those most affected (Preston & Armstrong, 1991; Schein, 2010). A useful summary defines a *stakeholder* as any person whose cooperation and goodwill are needed for the project to succeed. This definition identifies the primary stakeholders of the project as students, faculty, program directors, and UMGC's academic leaders. Throughout the project, stakeholder needs were discovered through analysis of data, analysis of faculty work, and surveys. Stakeholder needs were addressed using pilots, feedback sessions, development conferences, and individual conversations with faculty who actively applied coaching in their classes.

The team sought feedback, reflected on it, addressed issues, and communicated results to ensure that the change would be adopted. Schein (2010) recommended formulating a compelling reason for change for each of the stakeholder groups to follow when implementing a cultural shift. For this project, these reasons (following), have guided the decisions throughout the project.

1. Students see kinder and more helpful feedback delivered in a safe environment to be a compelling reason to desire coaching.
2. Faculty see the chance to engage with students more personally and helpfully as their reason for change.
3. Academic leaders desire to improve student learning and increase persistence and to make the change quickly and with faculty acceptance.

The latest report by Patch (2022) shows no significant difference in student perception of faculty practices post-FacDev112. This does not suggest students would not value the conditions of "compelling reason 1", only that they did not, statistically speaking, recognize a sufficient difference. A formal study of their experience, such as done with self-growth papers (Ellis et al., 2019), would give additional insight into determining what does matter most for them. From a positive viewpoint, coaching did not hinder their perception, grades, and persistence.

For faculty, the power of compelling reason 2 is observable in their coaching implementation plans and teaching philosophies where over 84% expressed their intent to coach students.

Ample evidence exists to confirm reason 3 as compelling. The twin focus of improved learning and retention (i.e., persistence) is evident in most leadership meetings at the institution. At the present time, the desired outcome expressed in the compelling reason has not been demonstrated (Patch, 2022).

Table 9 summarizes the steps taken by the authors to collect and apply stakeholder feedback.

The project benefited from these guiding principles because they were used by decision makers to remain true to stakeholders' compelling reasons for change. The finding of no statistical difference on reasons 1 and 3 does not invalidate the reasons; rather, the results suggest additional time and efforts are required. The data were collected in the term following training. Changes were expected in faculty behavior and mindset, first, to be followed by student behaviors leading to changes leaders want to see. Time is required to develop expertise in coaching and another data collection needs to be carried out as a 12 month follow-up. In addition, research to understand what faculty and others could do to ensure students receive the benefit of coaching needs to be completed sooner to better plan for supporting changes.

Design Considerations (F1)

The paper and book of Merrill, *First Principles of Instruction* (2002, 2012), proposed that all courses be Effective, Efficient, and Engaging. These principles guided the approach to designing FACDEV112, suggesting to designers that the mnemonics SOLID and ROCK-SOLID be used to make the instruction and subsequent practice by faculty more effective. Effectiveness was also achieved through the design of realistic examples, checklists for quality of coaching, and hands-on exercises. The modified Bloom's Taxonomy of Bobrowski (2007) that calls for students to demonstrate applying course principles to different situations enhanced course effectiveness.

Designers closely monitored efficiency of the course from its beginning and purposefully allocated FACDEV 111 a three-day slot and FACDEV 112 a ten-day slot with the further limit of five hours and ten hours of learning time, respectively. Repeated simplifications and improvement of resources addressed efficiency concerns of faculty and program directors, such as deleting discussion questions or making them optional when faculty protested their deletion. Designers made the content more engaging through hands-on exercises, discussions with colleagues, and approximately 45 minutes of video content.

Designers went beyond effectiveness, efficiency, and engagement as principles for the course because they considered the same attributes as vital for coaching. Without these attributes, the concept of coaching would not culturally take hold among faculty and students. Applying

these attributes to the content reflects the importance of real-world validity for any change initiative. Designers addressed effectiveness and efficiency of coaching through inclusion of templates, checklists, and self-coaching. They suggested approaches to developing expertise incre-mentally before committing to full implementation so the impact of learning to coach by doing would not detract significantly from teaching.

The deliverables in the course help adoption of coaching because faculty are asked to

- Identify their fundamental reasons for adopting coaching as they reconsider their teaching philosophy statements, thus making it easier to understand and adopt coaching
- Practice coaching and receive coaching from peers and instructors to demonstrate the learning benefits and to personally experience the emotional impact of coaching
- Examine and receive feedback on their approaches to implementing coaching in their specific courses, including a realistic appraisal of obstacles and what they would do to overcome them

Training differs from typical academic courses because designers can observe the impact of such a course **on** practice, whereas it is difficult to see student application of their learning **in** practice. The evaluation of FacDev112's impact (Patch, 2022) on student perception, faculty usage, and learning and persistence showed that faculty had taken up the coaching practices (Figure 7) while the other results showed no statistical differences. The least implemented coaching practice is "self-coaching." The designers believed this practice to be essential to the development of strong coaching and the lower uptake may explain the oth-

Table 9 Summary of Steps from Figures 3 and 4 that Collect and Apply Stakeholder Feedback

Steps	Discussion
2-4	One author interviewed the provost and 40 other program directors and academic leaders to determine needs and opportunities within the UMGC educational model. The findings from these interviews were reflected back to a larger audience through six face-to-face workshops where coaching was practiced by the participants. Attendees provided written feedback. The provost chose developing faculty to use coaching as the project.
6-7	Faculty participated in the pilot offerings of FACDEV 111 and generated feedback in the form of statements and questions in the discussion areas of the course. This feedback helped refine the course and support that faculty would be receptive to the training. This decision helped fund the project and enlist support of key leaders.
12 & 16-18	The assessing and reflecting on student performance and analysis of student feedback addressed first the goals of the institution to improve learning and persistence and then student attitudes toward the different learning experience. A separate faculty survey showed faculty satisfaction higher due to the course format and interaction with students. The positive feedback from students on the seven principles encouraged designers to incorporate the principles into ROCK-SOLID.
19-20	Faculty Affairs conducted pilots to determine the effectiveness, efficiency, and engagement of FACDEV 112 before expanding it beyond 55 faculty. Faculty feedback in discussion areas guided improvements to the course.
21	Faculty Affairs sought the provost's feedback and approval to ensure leadership support for the effort.
23	To build enthusiasm for the launch, Faculty Affairs held a live and recorded student panel to present what they considered the attributes of an excellent professor. During the Faculty Conference at UMGC, FACDEV 112 instructors, among others, presented perspectives on coaching and mentoring and Faculty Affairs promoted the upcoming launch.
25-26	Assessing feedback from program directors through meetings and faculty feedback (via analysis of their implementation plans) both surfaced the time issues and showed that faculty had designed effective means to address them.
30	FACDEV 112 instructors use a Microsoft Teams channel to ask questions, raise issues, and suggest changes in the course. Through this feedback, the designers shifted from a two-phase model to a three-phase model of coaching that makes the analysis phase explicit with the intent to make it easier for faculty to apply.
32	A follow-up confirmation of faculty's intent to use coaching revealed at least 84.5% planned to do so versus 1.5% who did not. Follow-up will examine correspondence of intent with intent and obstacles in the faculty's coaching plans.

er results of the report. An additional practice suggested in the implementation plan description suggests coaching circles which could also improve faculty practice.

Process Insights (F3)

The process of implementing an intervention that improves learning and persistence reflects a specific and modified application of the EDR schema. Applying the schema to the actual events, as depicted in Figures 3 and 4, demonstrates the importance of integrating each step and testing the way forward while addressing stakeholder wants and needs. Reflecting on this project through the lens of EDR generates the following insights that could contribute to similar efforts.

- Engaging key stakeholders up front helped set the project on a widely approved path. While not evident in the schema of Figure 2, not having agreement from others when the goal is to implement an intervention, dooms a project to failure.
- Continuous experiential data collection and feedback helped the authors make better decisions. The tests of an EDR-based project provide answers to key questions. Numerous design decisions and insights came from designers supporting their intervention and learning from the interaction with stakeholders.

  Explicit representation of tests to support transition decisions is recommended as a contribution to the EDR approach.
- Starting modestly allows the approach to get worked out. It parallels the agile product development strategy of beginning a project with a minimum-viable-product, allowing for quicker piloting and learning before over-committing resources that will be needed later (Pilcher, 2010).
- The authors kept key documents that supported the representation of the project as EDR. Other information lived inside emails between team members. Keeping journals during the project allows personal thoughts to be captured and revisited without relying on memory. The practice of journaling and periodic reflection will become a standard practice of the project to enhance the quality of grounded reflection.
- Being open to change of the original concept based on new information, observed problems, and test results is required for success. An example is when the seven principles of learning and persistence were incorporated into ROCK-SOLID to achieve broader results.
- Having a grand purpose while operating in the details keeps a project true to its objective and prevents success from devolving into simply launching a course or other less meaningful goal. Ottingen found this to be true with individuals, and the authors found it to be especially true when compared to the time and resources required for large change. This same purpose frames the "doing the right thing" portion of stakeholders' compelling reasons for change. Alignment of purpose with the leaders' purpose helps maintain support for the project. Managing expectations with frequent communication keeps the project energy alive for stakeholders. Showing maximal impact could lock in that support.

Future Research

While FACDEV 112 has been scaled to almost 2,000 faculty completions, the parent project is not complete. Only multiple subprojects are complete and guide future planning. UMGC's office of academic research has evaluated the early impact of the initiative (Patch, 2022). The most positive result of this evaluation has been the uptake of most coaching practices, with the exception of self-coaching. The other results from the report show a need to better understand the post-FacDev112 environment, the self-development of coaching, and to prioritize incentives and actions to reduce barriers. Encouraging self-coaching will become a focus in on-going support of completers.

More effort into analyzing the practice and results of coaching could also yield additional insights into the theory of coaching, what works better, and what is less effective. The impacts from differing subjects, course design, and even learning models need teasing out.

Finally, if other institutions approach improving learning and persistence through adoption of coaching, then comparative research with what has been done at UMGC will produce insights on implementing large scale, meaningful change.

Conclusion

The research-based practices of educational coaching and the seven principles of learning and persistence were creatively synthesized into the ROCK-SOLID Coaching Method. Using EDR, the team incrementally explored meeting the institutions', learners' and faculty's needs for improved learning and persistence. The project requires a long-term, transformational approach to reach its full benefit, and early results are encouraging.

The investigation shows the importance of building on research, testing it in the real-world through many iterations, measuring the results, learning from them, and implementing needed improvements. The documented approach with insights and examples is offered as a guide to future work on the project and to others.

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Developing Transferrable Knowledge Using the Methodology for Generalizing Knowledge

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Abstract

The Methodology for Generalizing Knowledge (MGK) is introduced as a guide for the process of turning knowledge into working expertise that can be fluidly transferred to novel future contexts. Generalizing is a process that requires analyzing how knowledge is applied across increasingly diverse contexts, revealing cues which signal when and why application of that knowledge is needed, along with underlying principles required to successfully apply the knowledge. This study takes an educational design research approach incorporating participatory action research and educational design research to connect prior research on metacognitive processes in learning, problem solving, and levels of learning to produce the MGK. The results advance understanding of the generalizing process, provide a model of the process illustrated with a simple example, and connect it to the processes of learning, problem-solving, and transfer of knowledge.

Introduction

A critical ingredient in effective performance of learning and problem-solving is the ability to transfer existing knowledge to new contexts. For transfer to occur, there must be available generalized knowledge which can be applied to new contexts as working expertise. It is the process of generalizing knowledge that enables fluid transfer of that knowledge for new learning and for application to novel problem-solving situations. Unfortunately, systematically helping learners develop the skill of generalizing remains an elusive challenge. Students often struggle with tasks asking them to use what they have just learned when the context of using that knowledge shifts even slightly (Hammer et al, 2005; Rebello et al., 2007; Woolridge & Weinstein, 2016). This frequent failure to successfully leverage existing knowledge that would be valuable in new contexts illustrates the important role generalizing plays within the learning process and how the skill of generalizing is critical to problem solving.

In their discussion of knowledge transfer, Bransford and Schwartz (1999) note that "learning with understanding is important for enhancing performance on subsequent transfer tasks," and that "without attention to the degree of original learning, people can erroneously conclude that potentially helpful educational programs are ineffective." Their reference to the degree of learning—and learning with understanding—reflects how knowledge must be generalized to operate across contexts during transfer. Further, Leise, Beyerlein, and Apple (2007) illustrate with the Learning Process Methodology (LPM) how sufficient construction of knowledge (i.e., generalized knowledge) is needed to prepare for problem solving. With respect to learning, the LPM utilizes models to guide the learner in applying the same knowledge in multiple contexts and asks the learner to conduct critical thinking exercises which illuminate cues and underlying principles supporting use of the knowledge in a generalized way.

The process of generalizing is also fundamentally connected to problem solving. One can imagine the difficulty a person might have when solving problems, if they lacked the necessary working expertise to identify key issues, collect relevant information, identify assumptions, and generate solutions. The Problem Solving Methodology (Myrvaagnes et al., 1999) explicitly addresses each of these skills. These ideas are echoed by Chase, Malkiewich, and Kumar as they discuss how "noticing" impacts transfer situations in engineering (2019), or what Perkins (2008) deems "proactive knowledge" accessible even in low cue environments. Myrvaagnes notes that new knowledge generated from the problem-solving process should be generalized for future use. Generalized knowledge is thus a critical connection linking the learning and problem-solving processes. Apple, Ellis, and Hintze explain it this way:

> The relationship between these two processes is more than close; they are actually interdependent … learning is the process of constructing knowledge **in order to solve given problems**. Learning produces transferable knowledge (acquisition process) while problem solving is the sophisticated usage of this knowledge in a specific situation (application process) (2016b)

These connections between generalizing, the learning process, and problem solving have produced a need to clarify what the *application* level of knowledge looks like, especially at its highest level. Bobrowski (2007) states that in order to problem-solve the learner must have

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> …the skill to apply and transfer the particular item of knowledge to different situations and contexts, … recognize new contexts and situations to skillfully make use of this knowledge, … and (have) taken the time to generalize the knowledge to determine ways to apply it, testing boundaries and linkages to other information.

Nygren (2007b) calls this level of knowledge "transferable knowledge" or simply generalized knowledge. A learner with generalized knowledge is able to efficiently produce quality results based on working principles and even propose criteria to define quality as they tackle problems others can't (2007a). Appendix A expands on Nygren's work to provide details about what this knowledge looks like across the five different forms of knowledge (Quarless, 2007).

We introduce the Methodology for Generalizing Knowledge (MGK), as an explicit tool to help learners meet the challenge of elevating knowledge to the level of working expertise. Table 1 shows the four stages of the methodology with the steps for each.

As shown in Table 1, there are four distinct stages within the MGK:

1) **Validate readiness** to generalize by ensuring meaningful understanding exists (Step 1)
2) **Apply the knowledge** in different contexts (Steps 2 – 5)
3) **Analyze each application** to find cues and underlying principles (Steps 6 and 7)
4) **Build working expertise** by solidifying newly generalize knowledge (Steps 8 and 9)

The methodology begins in Stage 1 with Step 1's self-check on understanding of the knowledge one hopes to generalize. This step, similar to activating prior knowledge (Pressley et al., 1992), is intended to disabuse the learner of any assumption they may hold about already knowing. The step is essential for understanding what the knowledge represents; without it, the learner risks wasting effort by attempting to apply knowledge where actual understanding is limited. The best check for Step 1 is learners ensuring

Table 1 Simplified Methodology for Generalizing Knowledge

Stage/Step	Short Description
STAGE 1 — Validate readiness	
Step 1: Confirm knowing	Test understanding to ensure you can explain and respond usefully to questions
STAGE 2 — Apply the knowledge	
Step 2: Familiar context	Apply the knowledge in a very familiar context to explore how it works
Step 3: Similar context	Apply the knowledge in a slightly different context to explore how to transfer it
Step 4: Different context	Use the knowledge in a more challenging and different context
Step 5: Unfamiliar context	Use the knowledge in a personally challenging and difficult context with which you are not familiar
STAGE 3 — Analyze each application	
Step 6: Cues	For each context, inventory reasons why the knowledge was useful
Step 7: Underlying principles	For each context, extract the rules or approaches to using the knowledge that act as tips for successful application of the knowledge
STAGE 4 — Build working expertise	
Step 8: Make the generalization	Describe an integrated cue statement for why this knowledge can produce significant value given a set of conditions and a sequenced set of common underlying principles for producing that value
Step 9: Confirm working expertise	Reapply the knowledge through the prior contexts to validate increased capability in producing value with the knowledge

their understanding by teaching others and answering their questions.

Stage 2 comprises Steps 2 through 5 which progress through four applications of the knowledge in increasingly less familiar and more challenging contexts. Ideally, these four steps sequence both the difficulty of the context used, as well as the number of principles applied. As such, this stage applies the concept of *scaffolding*, as described by Hammond and Gibbons (2005); difficulty increases as the context moves from familiar to similar, to different, and finally to unfamiliar. In addition, scaffolding the complexity of application of the knowledge requires more of the component elements, or principles, of that knowledge with each new context. This will ensure not only a comprehensive collection of reasons why the knowledge becomes useful but also significantly widens the application of the knowledge by the time all four applications are complete.

Stage 3 (Steps 6 and 7) is where application of knowledge is analyzed in each context for cues as to reasons why the knowledge was useful and inventorying underlying principles governing the use of knowledge in each context. These steps are precursors to developing what Ambrose et al. (2010) summarize as mastery of the knowledge, where learners integrate needed skills to apply the knowledge and discover when and where to apply those skills. The process in Step 6 involves significant metacognitive thinking about what conditions make application of knowledge valuable as the learner explores similarities and differences among specific reasons the application of the knowledge was valuable in the four contexts. This results in a set of cues that indicate potential value for the knowledge in future situations and the conditions necessary for this value to be produced. After inventorying these cues, in Step 7 the learner works to identify the underlying principles that describe how the knowledge was effectively applied in all four contexts. The authors note from personal experience that learners are frequently frustrated with first attempts at completing these two steps. Not only is the knowledge they are developing just emerging at the application level, but many have not explicitly practiced the skills of identifying cues or underlying principles. Therefore, when initially using the MGK, it may be helpful to use existing prior learning that one would like to elevate which already spans multiple applications so one can focus on developing skill in applying Steps 6 and 7.

Finally, in Stage 4, working expertise is constructed through Steps 8 and 9. The term *working expertise* is taken from Nygren (2007b) and is consistent with the description by Ericcson (2005) in their commentary on how advances in expertise research apply to educational settings. In Step 8, the learner makes the generalization by cross-referencing the cues and principles across each context to determine the value that knowledge produced within each context. They also predict new contexts for when and where the knowledge might be useful in order to produce an integrated cue statement that matches the reason it is valuable with appropriate conditions. Another purpose of Step 8 is to compare the principles used in each context to identify which principles apply universally and which apply in only some contexts. Finally, in Step 9, validation of the resulting generalization is accomplished by reapplying this elevated knowledge, in its generalized form, to each context to test that this generalized knowledge is adding significant value to each context.

Literature Review

Generalizing is not the same as transferring, with respect to knowledge. Rather, generalizing is a learning skill that develops working expertise to a level enabling transfer of knowledge, when needed, to novel contexts. More specifically, the process of generalizing produces cues and underlying principles to link knowledge across multiple diverse contexts in order to facilitate problem solving. In short, *generalizing* is a deliberate learning process elevating one's level of knowledge for use in problem solving, while *transfer* is the ability to apply knowledge in a new context.

Metacognition, as defined in Schraw and Moshman's (1995) influential paper, may be usefully separated into "metacognitive regulation of thinking and learning" and "metacognitive knowledge." Subtypes of metacognitive knowledge are declarative knowledge about things, procedural knowledge about how to do things, and conditional knowledge about why and when things may be used. *A metacognitive theory* is knowledge that integrates a specific collection of declarative, procedural, and conditional metacognitive knowledge. Generalizing is an example of a metacognitive process (of thinking about thinking) that produces a specific metacognitive theory which guides the transfer of knowledge for a particular set of problem areas.

Connecting generalizing and other methodologies as generalizations of metacognitive processes (Apple et al., 2016a) allows the results being developed in metacognition to apply to Process Education as well. Moshman, in an update to Schraw and Moshman's 1995 paper, noted that many educational institutions "fall short of helping students (a) to understand the structure of theories, and (b) to use theories to systematize self-knowledge and apply that knowledge to self-regulation" (2018). Because Process Education methodologies, including MGK, are metacognitive procedural knowledge designed to support students' creation of knowledge, they hold the potential to help education institutions adopt a Process Education

approach, especially in fields reliant on problem solving and transfer of knowledge.

This description of generalization and transfer is consistent with prior research, in particular the large body of work on transfer as summarized by Lobato (2006). Nevertheless, the terms *generalizing* and *transfer* are often used interchangeably by practitioners (e.g., De Lay, 2016; ErinoakKids Centre for Treatment and Development, 2020). Therefore, we define *generalizing* and *transfer* as follows:

- *Generalizing* (preparing to use knowledge in new contexts) is the systematic production of robust understanding (working expertise) by analysis of knowledge use in multiple contexts, enabling transfer of that knowledge to novel future contexts
- *Transfer* (using the knowledge in a new context) is the application of prior knowledge or skills in a new context

We also define two more terms important for the discussion of generalizing, consistent with metacognitive conditional knowledge:

- *Cues* (triggers signaling that transfer is possible) are indicators, based on stimuli or prompts, that signal the need to apply certain knowledge within a learning context or problem-solving situation
- *Underlying principles* (requirements for applying the knowledge in a context) are rules or guidelines indicating how certain knowledge is applied within a learning context or problem-solving situation

The work by Sweller (2016) on cognitive capacity, together with Tricot and Sweller (2014) on why teaching general approaches to problem solving often fail, explains why the metacognitive process, as presented in the MGK, serves as a bridge to problem solving. Tricot and Sweller relate that learners without long-term memories of using relevant problem-solving knowledge are limited by working memory and are thus unable to deal with complexity. That is why initially learning from a worked example is effective: it allows learners to limit complexity by focusing on what is present in the example. As problem-solving experience grows, learner knowledge moves from short- to long-term memory, removing limits on how much working memory can be activated to solve a problem. This provides a mechanism for expertise, where substantial case knowledge is available to the expert without any constraint in use due to short-term memory limitations. With sufficient memory and working expertise developed from generalizing with the MGK, a learner can both apply knowledge and reason about that knowledge to perform Piaget's reflective abstraction/generalizing. Schraw (1998) shows that metacognitive knowledge is multi-dimensional, teachable, and applies generally across domains, so metacognitive theories such as MGK and its results, by specifying incremental, general steps, guide advanced problem-solving and may even accelerate it by limiting the complexity required. Schraw also describes the difficulty of researching metacognition due to opacity. The MGK and other methodologies that produce explicit descriptions of metacognitive theories support a window into the details of learning, reasoning, generalizing, transfer, and problem-solving amenable to qualitative research methods.

To further illustrate our definitions of *generalizing* and *transfer*, we note a case study from history used to illustrate the concept of generalizing in *How Students Learn: History, Mathematics, and Science in the Classroom* (National Research Council, 2005). There, the authors indicate that generalizing seems to occur when searching for principles extant in similar contexts. In our model, we propose that extracting "underlying principles" to explain a concept's use in different contexts is indeed critical to the skill of generalizing. Similarly, the seminal text *How People Learn* (National Research Council, 2000) devotes an entire chapter to learning and transfer, explaining that context is important in learning for transfer, but knowledge that is too contextualized hinders transfer. Therefore, we conclude that multiple contexts for the same knowledge are needed for generalizing, and we propose the same knowledge applied to increasingly *different* contexts is critical to generalizing. Finally, Herr (2007) describes "flexible representation of knowledge" as a major factor influencing transfer and includes the term *generalizing* to describe how transfer occurs to produce new learning or to solve problems. Although Herr does not clarify whether generalizing represents flexible representation of knowledge, transfer, or both, the overall conceptualization of generalizing enabling transfer is consistent with our definitions.

Generalizing makes use of the more fundamental process of applying knowledge. Atkinson and Shiffrin developed a cognitive framework commonly referred to as the *modal model* that combines the notion of short and long-term memories along with control processes that operate on them (1968). They contributed much to understanding *rehearsal* and *retrieval* control processes that first create long-term knowledge from short-term knowledge through rehearsal, and second make long-term knowledge available through retrieval. A later addition to the modal model, called SAM (search of associated memory), was developed by Raaijmakers and Shiffrin, and contributed the importance of context in retrieval as prompts and contextual cues (1980, 1981). *Recognition*, as "activating knowledge held in long-term memory that applies in a situation" extended the modal model further (Juola et

al., 1971; Atkinson et al., 1974; Atkinson & Juola, 1973, 1974). Subsequent research clarified how retrieval works probabilistically across multiple, similar target memories. Learners reinforce memories through rehearsal and hence increase the probability of the memories being recalled when needed.

Rehearsal helps learners reinforce memories and contextual cues when they use a formal process and explicit representation of knowledge to be learned. Working with children as language learners, Karmiloff-Smith developed the theory of Representational Redescription to describe four progressive levels of internal knowledge representation during learning (1994). The levels are, from highest to lowest,

- I, implicit knowledge, which is automatically applied
- E1, explicit knowledge, which is unconscious and opaque to language
- E2, consciously explicit knowledge but opaque to language
- E3, consciously explicit knowledge describable using language

The theory is useful in explaining how implicit knowledge transitions to explicit, shareable knowledge. Beaudoin uses Karmiloff-Smith's theory to explain how older children and adults transform objective, externally represented knowledge to explicitly represented, internal knowledge, E3, and progress through levels E2, E1, and I through deliberate practice (2014). In the same work, Beaudoin relates them to Piaget's concepts of assimilation, accommodation, and reflective abstraction.

Assimilation, as developed by Piaget and described by Beaudoin, relates concepts derived from information in a knowledge source to concepts already known by the learner. When a learner is presented with new concepts that do not fit with the old, they may, through careful reasoning, accommodate the new concepts by using learning skills to restructure their knowledge. The highest level, *reflective abstraction*, is a deliberate process of reviewing what one knows to build generalizations. The MGK described in this paper is an explicit representation of knowledge that relies on enhancing retrieval of internal concepts to guide the generalization process. Learners also construct methodologies (metacognitive theories) to represent problem-solving approaches. (For more on methodologies, see Smith & Apple, 2007.)

Finally, Fyfe et al. (2014) reviewed *concreteness fading*, an approach used primarily in mathematics and science consisting of a three-step process led by a facilitator and moving from concrete to abstract representation "guiding learners to strip away extraneous concrete properties and distill the generic, generalizable properties." It is our contention that a learner, with practice, can identify and use just four contexts to produce generalized transferrable knowledge.

Methods

The overarching goal of the research related to the Methodology of Generalizing Knowledge is to develop, test, implement, improve, and scale up a methodology that learners can, with practice and coaching, use to generalize knowledge in support of transferring their learning to new problems and a methodology that instructors may effectively teach.

AR/PAR

The beginnings of the MGK can be traced to an Advanced Teaching Institute (ATI) held at Edgewood College, June 10-14, 2000. The overview and stated outcomes of that Advanced Teaching Institute (Apple et al., 2000) firmly situate the initial work leading to the MGK within the tradition of Participatory Action Research (PAR).

Action research (AR), as described by Reason et al. (2001) and Denscombe (2014) is concerned with the real-world, is designed to develop and test change strategies, uses a cyclical feedback process, and involves practitioners as participants and sources of knowledge. James et al. built upon that, naming a form of AR "Participatory Action Research" (PAR) because it goes further than AR, giving full status to the participants instead of simply involving them.

The outcomes of the Advanced Teaching Institute include the statements, "The themes to be pursued at the event are determined by the needs and priorities of the participants" and "Educational research and generating new knowledge are priorities" (Apple et al., 2000). Further, an overview describing the ATI highlights that it differs from a Teaching Institute in that "there will be a greater orientation toward research (especially action research) and generating new knowledge" (Apple et al., 2000). This centering of the research conducted during an ATI, as based on the needs and priorities of the participants, allows us to categorize the products of that institute as the result of PAR, regardless of how incomplete that work might be. In the case of the MGK, its very beginnings can be traced to ATI learning activity #14, Working on the improvement of the quality of Assessment, on June 11, 2000. The effort was focused on raising insights from level 1 of Bloom's Taxonomy (knowledge) to Level 3 (application). The journal from this event attempts to record "Effort to raise this (insights in an assessment) to Level 3 by each group." It then offers a series of level 1 insights. The final sentence recorded in that final

activity of the day is, "Perhaps a methodology for getting from Level 1 to Level 3 may be helpful" (Apple et al., 2000).

Dan Apple recalls

> That evening (June 11, 2000), I created the Methodology for Elevating Knowledge from Level 1 to Level 3. The next day (June 12, 2000), we shared this methodology and started working with it. We didn't have an activity or anything, but I just used the learning challenge people were struggling with which was the relationship between cooperative and collaborative learning [to explore the new methodology] (D. Apple, personal communication, April 8, 2023).

The first iteration of the Methodology for Elevating Knowledge appears as part of the results of Activity #19, Methodology for Quality Assessment, in the ATI Journal; Steps 4 through 9 form the basis of the nascent MGK (Apple et al., 2000):

1. With the framework [of understanding] in place, test the conditions of the structure (e.g. the validity of the assumptions, the logic, value or benefits, what else….) (level 2)
2. To enrich the knowledge, find a context you are familiar with and, transfer and apply the knowledge to that context. (low level 3)
3. Transfer and apply the knowledge to another context that is similar. (low level 3)
4. Make a transfer and apply the knowledge to a context that is far away from the original context. (level 3)
5. Pick a totally unfamiliar context (e.g., different culture, discipline) and transfer and apply the knowledge; play role of consultant. (level 3)
6. Make a generalization (level 3)

One of the event participants, Kip Nygren, shared the observation that critical thinking questions are a tool for exploring the transfers at each level. Of note, Kip would go on to write the *Faculty Guidebook* module on Elevating Knowledge from Level 1 to Level 3 (Nygren, K., 2007b). This represented not only a further iteration of stepwise generalizing within PE research, but continuity of participation.

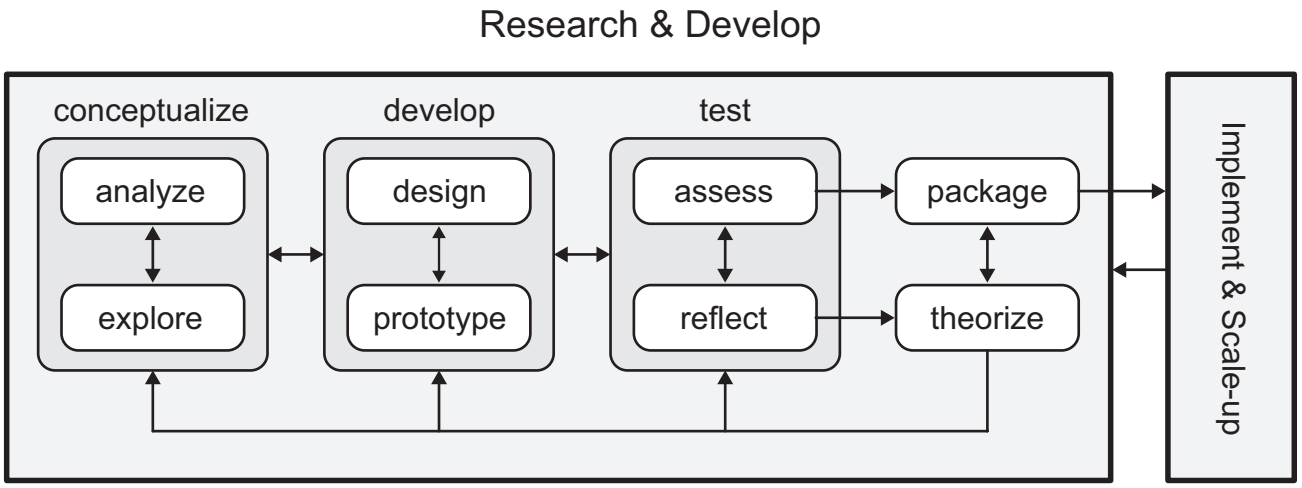
Educational Design Research (EDR)

While PAR describes the context and stakeholders of the inception and initial research on MGK, it does less to capture the iterative nature of that work over the years since. To appreciate that process and its contribution to the current MGK, we rely on Educational Design Research.

As described by McKenney & Reeves (2012), EDR provides a strategic framework that progresses iteratively from concept to implementation to produce a quality educational design that can scale to broad practice. Figure 1 depicts this framework which aims to give structure to the research process using a participatory, real-world approach involving teachers and students (broadly defined) to ensure resulting implementations are teachable and effective. As experience is gained, researchers develop theoretical explanations.

EDR is a way to appreciate the structure of long-term research to coordinate many smaller research projects. The structure can also guide the development of a design iteratively across the conceptualize, develop, test, package, theorize, and implement/scale up phases. With EDR, a researcher applies methods, involves educators in generating solutions, and engages learners in learning and applying the methods. Researchers also induce practical, effective solutions from the practice and reflection of the participants that are then iteratively tested and refined to improve the results. In the case of the MGK, EDR was not used as

Figure 1 The flexible research framework of EDR. Adapted from McKenny & Reeves (2012)



a project plan for how to proceed, but rather provides a schema or lens that allows for appreciation of the iterative and improvement-focused "conceptualize-develop-test" process that took place with the MGK.

PAR within EDR

The Participatory Action Research approach continued over subsequent years in the contexts of various faculty development institutes, work on learning to learn curricula, and no fewer than three Process Education Conferences. Participants in each of these contexts shared input that was analyzed and then integrated into the evolving MGK. Each iterative improvement consisted of a set of processes analogous to a PAR loop as situated within the larger project-type structure of EDR (Figure 2).

The PAR-within-EDR cycle may start anywhere, but typically begins by studying the practice as it is currently performed, collecting qualitative and/or quantitative data, and proceeding to Steps 2 and 3. The cycle ends when assessment and reflection determines whether theorizing or packaging could be done. Unproductive cycles either continue iterative improvement or determine the current path will not yield quality results.

After the authors began concerted work on generalizing, we packaged an updated version of the MGK. In terms of Figure 2, this package exited the general PAR loop to be introduced as a paper submitted to support a workshop on generalizing knowledge at the 2017 PE Conference (Utschig, 2017). There, another PAR cycle occurred with groups of faculty working through the methodology, using think-aloud approaches and documenting their efforts using the methodology for a variety of different types of knowledge. This work led to another version (revision) of the methodology and an extended, revised paper was presented at the 2018 PE conference, where the methodology was shared in a research session and feedback on the paper was solicited and collected (Utschig, 2018). From that input, the paper was revised again, and another PAR context was created in the form of a workshop session delivered at the 2019 conference where participants were introduced to the content of the paper and the MGK within it, then working in groups to utilize the MGK as part of the workshop (Utschig, 2019). That led to additional revisions and brought us to the cycle of feedback immediately preceding publication of this article. This sequence of conference workshops represents several PAR-type cycles contributing to the larger EDR-type cycle. The result, after a variety of refined and packaged versions of this theoretical model, is the Methodology for Generalizing Knowledge.

While this research completes the foundational aspects of the overarching goal to develop, test, implement, improve, and scale up a user-friendly and useful methodology, much remains to be done with respect to the EDR iterations of implementation, improvement, and scaling up. Those aspects are beyond the scope of this paper. Nonetheless, we offer ideas for future research along these lines in the conclusion.

Results

Table 3 offers a detailed explanation of the content introduced in Table 1 and the supporting descriptions of the four stages. We explain what needs to occur within each step to achieve stronger results from using the MGK presented in Table 1. The explanations offered here for each step are intentionally written using second person language speaking directly to the learner.

Figure 2 The iterative process of PAR embedded in EDR. Adapted from Denscombe (2014); James et al. (2008), & McKenny & Reeves (2012)

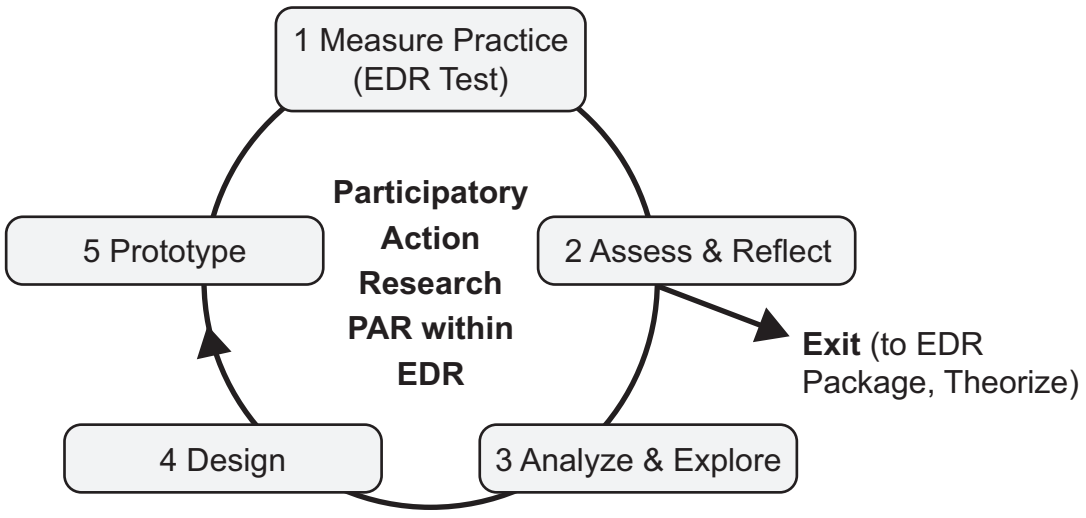


Table 3 Methodology for Generalizing Knowledge

Stage/Step	Description
STAGE 1 – Validate readiness	
Step 1: Confirm Knowing	**Test the quality of understanding.** Check if you can truly articulate what this knowledge means before applying it. Can you explain the knowledge to someone else? Is your understanding strong enough to answer their questions? Have any potential misconceptions emerged, or have any limitations been discovered about the meaning of this knowledge?
STAGE 2 – Apply the knowledge	
Step 2: Familiar context	**Explore and enrich fundamental understanding.** Choose a context so familiar that you can use the situation to clarify your understanding and test validity by seeing if it works the way you understand that it should. Reflect on any new learning, note cues as to why the knowledge was useful in this context, and note any principles or rules used to apply the knowledge.
Step 3: Similar context	**Contextualize the knowledge.** Pick another context that is similar, but not as familiar, to investigate how to move this knowledge effectively to this new context (i.e., transfer). Again, reflect on your learning to identify additional cues showing why the knowledge was useful for this context and rules (principles) required for how to transfer the knowledge.
Step 4: Different context	**Choose a context that has key differences from the previous contexts.** Select these different characteristics to provide a challenge in transferring the knowledge. Reflect on new learning to identify other cues showing why the knowledge was useful to this context and additional rules (principles) required for effective transfer.
Step 5: Unfamiliar context	**Transfer knowledge to a distant context.** Thinking like a consultant, take a personal/professional situation and determine how one could make use of this knowledge to produce value in this situation. Choose the most complex scenario you can imagine for applying this knowledge. Include all possible issues that might arise in the situation. As always, identify the additional reasons why one would use this knowledge (cues) and rules for how it was effective (principles).
STAGE 3 – Analyze each application	
Step 6: Cues	**Inventory all reasons and associated conditions for why the knowledge was useful.** Review and list unique reasons why and associated conditions from each of the four contexts to explain why the knowledge produced important value. The goal is to understand and be able to explain the conditions for any situation that make the knowledge capable of producing value when it is applied.
Step 7: Underlying principles	**Inventory principles (rules) used to apply the knowledge.** For each of the four contexts, list the principles that must be followed for the knowledge to produce the intended outcome. What had to be followed to skillfully apply the knowledge and produce value in each context? How would you articulate this rule as a tip for someone else to help them learn to successfully apply the knowledge?
STAGE 4 – Build working expertise	
Step 8: Make the generalization	**Generalize understanding.** Through reflective thinking & writing: 1) describe similarities and differences between the why the knowledge was valuable and the conditions (cues) which might trigger additional inquiry in order to expand your overall understanding of why and when to use this knowledge; 2) identify the common underlying principles used in applying the knowledge across all contexts and sequence them; 3) identify value produced by applying this knowledge to each context, 4) predict new contexts where value can also be produced.
Step 9: Confirm working expertise	**Reapply the knowledge, now using it as working expertise.** (This is your expanded why, knowledge of the conditions, and sequenced list of principles). Rework each of the four contexts to see how much capability you have in producing value with this generalized knowledge. The greater the value added, the stronger the generalization.

Table 4 Simple Example of Using the MGK: Sharpening a Cutting Tool

Stage/Step	Description
STAGE 1 – Validate readiness	
Step 1: Confirm Knowing	Making a cutting or piercing tool sharp with a designed sharpening resource enhances the ability to cut or penetrate an object more effectively, quickly, and with greater precision
STAGE 2 – Apply the knowledge	
Step 2: Familiar context	**Sharpening a smooth-edged kitchen knife blade** Using a whetstone (be sure to soak the stone for 10 minutes before you use it), move the knife straight down an imaginary center line, pulling the handle away from the stone as you go to hone both the straight and curved part of the edge. Repeat this motion several times to ensure the edge of the knife is sharp, then repeat on the other side of the knife edge. (https://www.thespruceeats.com/guide-to-sharpening-a-knife-4081187)
Step 3: Similar context	**Sharpening scissors** Fold a sheet of 150 grit aluminum-oxide sandpaper in half so the abrasive surfaces are visible. Use the scissors to cut the sandpaper into narrow strips. Each cut of a strip will sharpen each blade of the scissors a little bit.(https://www.wikihow.com/Sharpen-Scissors)
Step 4: Different context	**Sharpening a lawnmower blade** Remove the blade from the lawnmower. Clamp the blade in a vice at an angle with one of the cutting edges facing up. Notice that the cutting edges at each end of the blade are only 3 or 4 inches long and are only on one side of the blade (the other side is flat). Using a drill-powered blade sharpener, slowly move the stone back and forth along the cutting edge with moderate pressure. Repeat the process on the other end of the lawnmower blade, removing a similar amount of material as you sharpen. Check to make sure the blade remains balanced by placing the blades center hole over a nail and continue sharpening on the heavy side if needed. (https://www.thetoolyard.com/2018/12/sharpen-mower-blade.html)
Step 5: Unfamiliar context	**Sharpening a serrated knife blade** Here you will only want to sharpen the beveled side of the knife. Never sharpen the wrong side of the knife. It is best to put the knife in a vice. Using a sharpening rod, carefully sharpen each valley or gullet on the serrated edge. On most serrated knives, the gullets are all the same, but on larger knives they may be of different sizes, and you will have to use different size sharpening rods. (https://imarku.net/blogs/news/how-to-sharpen-serrated-knives)
STAGE 3 – Analyze each application	
Step 6: Cues	1. Cutting edge cannot penetrate the current material. 2. Cutting damages the material, causing wastage. 3. Cutting doesn't match needs of the situation. 4. The cutting edge is dull. 5. Cutting precision is not acceptable. 6. Productivity is significantly reduced. 7. An instrument exists to sharpen this type of cutting tool.
Step 7: Underlying principles	1. Pick the appropriate sharpening resource designed for the cutting edge. 2. Apply the sharpening resource as designed. 3. Be economical in use of the sharpening resource. 4. Move either the cutting tool or the sharpening device but not both. 5. Flip the cutting edge to do both sides of the edge. 6. Ready the edge that will be sharpened. 7. Fix one of the objects so that it can't be moved. 8. Be consistent in applying the sharpening process (i.e., apply equally for balance by repeating without variation).

Stage/Step	Description
Step 7: Underlying principles (con't)	9. Validate the cutting tool is still in balance. 10. Never sharpen the other side of a single-sided blade. 11. At times, small improvisation will be necessary without violating design. 12. Remove a minimal amount of edge surface to reach level of sharpness. 13. When cutting edge's width is too short, remove some of the fatter part of the blade surface (the shoulder) to widen the edge. 14. Sharpen until the appropriate cutting angle is achieved across the entire blade length. 15. Repeat the process to get the degree of sharpness desired. 16. Avoid removing more material than is needed to extend tool life and maintain its strength. 17. Test frequently to get closer to desired sharpness without going beyond.
STAGE 4 – Build working expertise	
Step 8: Make the generalization	**Why** – when something's sharpness doesn't meet current need in effectiveness, productivity, quality, or precision in cut, sharpening will return the function of the cutting edge so it meets the desired specifications. **Conditions** – When the cutting edge cannot penetrate current material, damages the material (causes wastage), doesn't fulfill the need of the situation, is dull, the precision is not acceptable, or productivity has been reduced, and an instrument exists to sharpen this type of cutting tool. An additional condition is that you can carry out the process safely (otherwise, bring the cutting tool to an expert). **Basic Principles** – There are a set of things to do to sharpen a cutting edge effectively: 1. Pick the appropriate sharpening resource (the one designed for the cutting edge). 2. Apply the sharpening resource as it was designed. 3. Be economical in use of the sharpening resource. 4. Move either the cutting tool or the sharpening device but not both. 5. Be consistent in applying the sharpening process (i.e., apply equally for balance by repeating without variation until the appropriate cutting angle is achieved). 6. Repeat process to get the degree of sharpness desired. 7. Sharpen until the appropriate cutting angle is achieved across the entire blade length. 8. Test frequently to get closer to desired sharpness without going beyond to extend tool life and maintain its integrity by removing a minimal amount of edge surface. **Conditional Principles** 1. Ready the edge that will be sharpened (especially when cutting edge is hard to access). 2. When cutting edge's width is too short, remove some of the fatter part of the blade surface (the shoulder) to widen the edge. 3. Never sharpen the other side of a single-sided blade (single-sided cutting edge). 4. Validate the cutting tool is still in balance (when balance in cutting edge is required). 5. Flip the cutting edge to do both sides of the edge (only with a two-sided cutting edge). 6. Fix one of the objects so that it can't be moved (when recommended for applying the process consistently). 7. At times, small improvisation will be necessary without violating design.
Step 9: Confirm working expertise	With this expanded why, conditions, and principles, sharpen the knife, scissors, lawn mower, and serrated knife once again to see if you can sharpen more quickly, safely, and with greater precision, resulting in minimal wastage and cutting-edge meeting intended specifications. We then imagine where and how another sharpening surface could be transferred to a different cutting object such as a shredder, a hedge trimmer, or a chisel.

In Table 4, we offer an illustrative example for the use of the MGK. We have chosen to use an area of knowledge for which nearly every reader should feel a significant familiarity: sharpening a cutting tool such as a knife. By choosing this topic, we expect the reader should be able to follow the steps of the MGK without having to construct any additional knowledge to successfully enter Stage 1 of the methodology.

While exploring the following example of generalizing, keep in mind the following perspectives on this knowledge:

- What (sharpening is a process to make an instrument cut better)
- Why (making the instrument more effective, efficient, and precise in use)
- How (here a sequenced set of eight universal and seven conditional principles or rules that when used will produce sharp instruments)
- When and where (conditions providing cues something's sharpness doesn't meet current need in effectiveness, productivity, quality, or precision)

Discussion

Generalizing focuses on building capability to use particular knowledge effectively and efficiently across any context, as opposed to simply increasing understanding. Thus, the nine step MGK articulates how to use knowledge that is meaningful (high level 2) and from this construct generalized, transferable knowledge (low level 4). The methodology was designed to support five perspectives which cue the reader where they can use the MGK.

1. Life-long learners can use the MGK to strengthen learning performance through generalizing. Everyone can do this.
2. Learning facilitators can use it to mentor learners more effectively in generalizing, especially when prerequisite knowledge is not transferable.
3. Designers of learning activities can produce learning activities that incorporate all nine steps of the generalizing methodology.
4. Researchers can guide qualitative research by following many of the steps of the MGK and can make explicit the metacognition involved in key learning and performance tasks to support additional research.
5. Problem solvers can trigger the use of this methodology when their ability to transfer knowledge is not satisfactory and the knowledge is critical to an effective solution.

In each of these situations, we need working expertise and without it, the applied learning doesn't meet the needs of the situation. The conditions in each of these five areas that make generalizing valuable are when

1. Knowing is not enough (level 2 does not meet level 4 need)
2. Experience of use across several contexts will help to address the given requirements more effectively
3. Current ability to transfer the knowledge is limited without someone prompting its use
4. Current generalizing process and supporting learning skills are not strong
5. One is not up to the challenge of designing or using world-class learning experiences
6. One wants to elevate the value of insights when using reflection and self-assessment (Leise et al., 2022)

The methods and analysis here produced an integrated why and six conditions when using one's knowledge in sharpening that will produce significant value.

The following represents an inventory of the benefits from using the MGK with the principles in situations when these cues exist. It is our hope that this list helps others to generate insights about the value of incorporating generalizing into the learning process for any context.

1. Knowledge that will support expected future learning: When having learned something potentially intriguing for later use, applying the MGK will greatly enhance ability for unprompted use of that knowledge when one can see potential for expanded value. Cross-context usage of knowledge will create additional meaningful value.
2. One is having difficulty in using existing knowledge: Each context provides a potential opportunity to generate new and refine existing principles.
3. To validate the value of the knowledge: Contexts produce means to document value by demonstrating that the generalized knowledge is worthwhile.
4. Prerequisite knowledge is deficient: Moving prerequisite knowledge from familiar to unfamiliar contexts enables re-use of learning from prior efforts. The process can clarify all areas where understanding is fuzzy.
5. Solving problems: Knowledge is needed when entering a new, previously unexpected context. If a problem becomes complex quickly, then generalized knowledge of content related to the context needs to be developed first.
6. Spinning your wheels: When one isn't sure how to apply what they have learned, working through the MGK will greatly strengthen that ability. Intentionally exploring generalizing the knowledge may turn this

wasted energy into productive struggle and develop a willingness to take leaps in complexity with application of the knowledge.

7. Credibility in application of the knowledge is needed: The process should iteratively increase skillfulness in use of the knowledge.

We now turn to the principles (rules or truths) about generalizing that are needed to successfully apply the MGK. We identify five common underlying principles for applying generalizing, stating each principle and then describing the value the principle brings to any context where generalizing will be applied.

Principle 1 New generalized knowledge can only be built upon current generalized transferable knowledge. This requires the learner to effectively transfer prerequisite knowledge to the current learning challenge (otherwise the perceived knowledge construction will be "fragile").

Generalizing is a critical capability that can dramatically improve both learning and problem-solving performance. In contrast, fragile knowledge is produced by the "training model" of identifying specific skills and helping students to recognize and apply these skills to specific contexts using lots of practice. What is missing in the training model is learners understanding how and why they do what they do. Consequently, the ability to take these skills and apply them to new situations is deficient (lack of generalization). This essentially rules out effective and efficient problem solving.

Principle 2 The development of strong comprehension is a crucial stage in the learning process and is a prerequisite for being able to contextualize, generalize, and transfer knowledge.

This principle is embedded within Steps 1-10 of the LPM (Leise et al., 2007). When these steps have been effectively implemented, a learner is ready for the MGK. Nygren (2007a) illustrates readiness for generalizing knowledge within the table, Levels of Knowledge Across Knowledge Forms (see Appendix A), where such knowledge is characterized by the ability to: 1) synthesize with previous knowledge; 2) effectively communicate the knowledge to others; 3) internalize the knowledge; 4) clarify boundaries; 5) and explore possibilities for use.

Principle 3 Working expertise (generalized knowledge) is required for quality problem-solving performance.

Only recently have efforts by Process Educators focused on the need for students to develop the ability to generalize knowledge for transfer, bridging comprehension (level 2) to problem-solving expertise (level 4). For example, the five-year STEM UP program (Perkins, 2016) utilized a Learning to Learn Math Camp preceding the startup of the program to increase student learning performance in mathematics using *Foundations of Algebra* learning activities (Ellis et al., 2013). Pacific Crest also investigated having students use the Methodology for Elevating Knowledge (MEK) (Nygren, 2007b) in their recovery courses for university students trying to move off of probation or reenroll after dismissal. This practice introduces students to the concepts of generalizing and metacognition, including an assignment requiring elevation of knowledge using the resource *Learning to Learn: Becoming a Self-Grower* (Apple et al., 2013). These efforts produced major advancements in developing learner performance (Apple et al., 2016b).

Principle 4 The combination of Step 5 (Performance Criteria) and Step 13 (Self-Assessment/Self-Validation) of the LPM are used to test if knowledge has been generalized (a final meta-cognitive check).

With this principle, the learner distinguishes between thinking they know and knowing they know. This check is derived from three other methodologies: the Learning Process Methodology, the Problem Solving Methodology, and the Methodology for Elevating Knowledge from Level 1 to Level 3.

Principle 5 Knowledge cannot be transferred if the learner is unable to discern the contextual prompts in a situation because the knowledge will never be activated.

Nearly every faculty member has asked students, “Don't you remember doing this last week?” and heard students respond, "We’ve never seen this before!” The students do not recognize the need for the prerequisite knowledge in the current learning without the faculty dragging that knowledge out of them and filling in the gaps.

Conclusion

This paper offers new tools and perspectives to aid in understanding generalizing and what generalized transferable knowledge represents. In particular, the MGK describes the process required to produce generalized transferable knowledge and is connected to the different levels of knowledge produced during the generalization process. We have provided a detailed description of the MGK and an example of its application we believe is accessible to most readers because, in their life, they have likely implicitly completed Steps 1 and 2 of the MGK for the topic chosen.

The example provided in this paper is equivalent to performing Step 2 of the MGK on one’s way to generalizing the process of generalization. The authors recommend that the reader create their own similar, different, and unfamiliar learning situations where they can reuse the MGK in these three increasingly challenging contexts (Steps 3-5). The reader can, with the help of Steps 6 and 7, compare the cues

and principles used in applying the MGK to those situations against those offered in the discussion section which, we argue, would bring the reader through the remaining steps of the MGK to develop a generalized knowledge of the generalizing process.

Additional research is needed to test the process of teaching and using the MGK. Future research questions include:

1. Can everyone learn to generalize knowledge?
2. Can every type of knowledge be generalized?
3. What are the key learning skills needed for generalizing?
4. Can the MGK be applied across different forms of knowledge in different disciplinary contexts to produce generalized knowledge? For example:
    a. Familiar: concept (e.g., adding mixed numbers in mathematics) as an easy way to start generalizing
    b. Similar: process (e.g., determining boiling point in a laboratory setting)
    c. Different: tool (e.g., citation software for writing)
    d. Unfamiliar: contextual knowledge or way of being (e.g., civil war or a growth mindset from a humanities and social science perspective)
5. What added value might be produced when using the MGK in learning communities and cooperative learning contexts?
6. Can we build a performance measure for generalizing?
7. Does assessing the use of the MGK itself contribute to the quality of generalized knowledge achieved, or does it simply increase capability to generalize for the future?
8. What is the impact of increasing the complexity of application (building principles) versus familiarizing oneself with situations for application (building cues) as learners work through each context in sequence?

We close with a few thoughts about these questions. Our belief is that everyone has unlimited potential to become great generalizers, and that any knowledge item can be generalized for later use. To do this one needs to do the following

- Ensure that new generalized knowledge is built on existing generalized knowledge
- Use all steps of the Learning Process Methodology to support generalizing, as it requires strong comprehension and understanding be developed through the entire learning process
- Seek problem-solving contexts for applying generalized knowledge, since working expertise is required for quality problem-solving performance
- Treat generalized knowledge as a level of learning where identification of cues is critical for producing and later using generalized knowledge in a variety of learning and problem-solving contexts
- Confirm generalized knowledge is achieved by testing against existing performance criteria and through self-assessment

We believe that applying each of these principles will be necessary when pursuing any of the future research questions have proposed.

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APPENDIX A. Levels of Learning Required for Generalizing Knowledge

Defining progressive levels of learning helps learners and facilitators identify intermediate stages of knowledge on the way to building generalized, transferable knowledge. Each level of learning corresponds to different steps in the methodology and can be used to provide expectations for quality or means to measure whether the level has been achieved. In Table A.1, we have updated the levels of knowledge across knowledge forms by editing and adding rows to Nygren's table (2007a). We have mapped these onto the MGK in Table A.2.

Table A.1 Levels of Knowledge Across Knowledge Forms (to measure level of learning)

Concept	Process	Tool	Context	Way of Being
Level 0.5 Pre-Informational (Language) *Describes meaning in own words*				
Knows meaning of key words	Follows grammar, syntax, or sequence	Recognizes key symbols Identifies functions	Decodes acronyms Recognizes semantic meaning	Recognizes cultural value
Level 1.0 Informational *Memorizes and recalls information: Assesses quality*				
States facts and definitions Draws pictures and diagrams	Describes steps in a method using an example Initiates use of a method	Uses step-by-step instructions Recognizes purpose and intended use	Repeats stories Describes events	Follows conventions Responds to traditions
Level 2.0 Comprehension (Why, Meaning, Significance) *Produces good inquiry questions; Analyzes models effectively*				
Articulates understanding Describes relationships and linkages	Rationalizes use of steps Knows criteria for quality outcomes	Comprehends instruction sets Knows full range of use	Condenses a story Describes significance	Values its importance Values expertise
Level 2.5 Implications, Bounding, Contradictions, and Completeness Very aware of concerns; Seeks counterexamples				
Sees linkages Seeks underlying principles	Justifies sequencing Clarifies issues	What makes it efficient and effective Appropriate usage	Shares implications Synergizes stories	Relates to other ways of being Sees inherent challenges
Level 3.0 Low Level Application *Applies in a familiar context; Describes results*				
Selects appropriate knowledge Identifies principle used	Documents use of steps in a method Links steps together	Applies instructions Uses basic functions	Recontextualizes for similar situation Seeks essence	Notices value produced Notices negative reactions
Level 3.4 Medium Level Application *Applies in a similar context; Compares differences*				
Identifies issues Adds another principle	Focuses on difficult steps Tests results	Expands function use Explores features	Sees implications Sees discrepancies	Starts to produce value Starts behavioral change
Level 3.7 High Level Application *Applies in different contexts; Identifies contexts*				
Clarifies boundaries Identifies key principles	Internalizes use of a method Links with other processes	Uses hidden features Adapts instructions	Responds to subtle prompts Writes an interpretation	Conscious use Developing pleasure in behavior
Level 4.0 Low Level (Generalized Knowledge) *Efficient in producing quality results; Has working principles*				

Concept	Process	Tool	Context	Way of Being
Generalizes understanding Has issues identified	Mental Checklist Validates results	Internalizes functions Aligns use to context	Provides prompts for others Presents alternative interpretations	Interacts with larger community Professional
Level 4.0 High Level (Working Expertise) *Proposes criteria to define quality; Tackles problems others can't*				
Evaluates alternative models Synthesizes with other concepts	Customizes methods for future use Monitors quality in real time	Debugs fluently Creates customized tools	Serves as an analyst Writes a white paper	Serves as a role model Mentors others

Table A.2 Mapping Levels of Knowledge onto the MGK

MGK Step	Learning Level	Explanation
1: Confirm Knowing	High 2	Learners test the quality of their own level of learning before going to application.
2: Familiar context	Bridge from 2 to 3	**Test and enrich fundamental understanding.** Choose a context so familiar one can use the situation to clarify understanding.
3: Similar context	Low 3	**Contextualize the knowledge.** Pick another different context that is similar (not as familiar) to test ability to move the knowledge.
4: Different context	3	**Choose an original context with key differences from the previous context.** The context should provide a challenge.
5: Unfamiliar context	High 3	**Transfer knowledge to a far context.** Thinking like a consultant, take the most highly complex situation anyone might face and determine how they could make use of this knowledge to produce value.
6: Cues	High 3	**Inventory cues for why the knowledge produced value in each context.** Explore and identify additional appropriate cues indicating why this knowledge can produce value and what conditions make it possible. Update list.
7: Underlying principles	Bridge to 4	**Inventory principles (rules) used in each of the previous steps.** What had to be true to apply the knowledge effectively in these contexts?
8: Make the generalization	Generalized Knowledge: Low 4	**Generalize understanding** through reflective thinking and writing.
9: Confirm working expertise	Beginning Working Expertise: Low 4	**Reapply this expanded expertise back through all contexts.**

An Insight Methodology to Guide Creation and Validation of Discoveries

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Abstract

Insights have been a source of fascination throughout history and have been acclaimed as important knowledge that suddenly connects disparate observations, past insights, and experiential contexts into a new synthesis. Scientific, philosophical, and psychological researchers agree that the most highly esteemed insights, referred to as "Aha!" experiences are contingent on a combination of subconscious and conscious processes. Two other kinds of insights are consciously created from learning achievements and gestalt reinterpretations of experiences. All three types of insight are of interest within the Process Education (PE) framework as it has evolved over a 30-year history to its contemporary focus on enhancing self-growth through insights from assessment and reflection. The development of a new resource, the Insight Methodology (IM), supports the PE goal of capturing and deepening insights as consciously elaborated hypotheses or propositions clear enough to be acted upon. The IM is a seven-step guide that efficiently leads users to produce such outcomes when an observation has potential future value. Specific criteria are suggested for each of the seven steps of the methodology to move attention to increasingly clear propositions ending with a "tip" or guiding concept for application by individuals as well as mentors and coaches. By helping PE practitioners take control of elaborating insights related to observations from formal learning as well as other experiences, the methodology can lead to major conceptual breakthroughs with potential for strengthening learners, practitioners, and researchers.

Introduction

The experience of having a sudden insight, an "Aha!" experience, seems almost magical yet totally believable (Leicester, 2016). Insight has played a role in scientific discoveries, has been a significant topic of philosophical analysis, and has been studied by psychologists for its role in creativity (Csikszentmihalyi, 1996). Chuderski and Jastrzębski (2018) describe problems for which insight is an essential element. These "puzzle" problems, which have been studied since the 1930s by psychologists, are characterized as having equivocal meaning that strongly influences mistaken assumptions that block initial attempts at solution. Once the key is discovered or provided, the solution is obvious. Positive psychology (Seligman & Csikszentmihalyi, 2000), however, emphasizes development of preventive and progressive skills and personal characteristics (Peterson & Seligman, 2004) that promote an affirmative attitude about discovering insights to enhance quality of life (QoL). In contrast to this focus on problems characterized by a sudden key insight, insight can be extracted from a wide range of problem states that occur in daily life and have multiple possibilities for satisfactory solutions.

The accumulated theory and resources of Process Education (PE) (Apple et al., 2016) have been created with the goal of supporting transformative change even when well-established habits, attitudes, and traits hamper growth development. The first step along the growth path is to become an observant participant (Fowler-Amato, 2017) who captures something memorable and generates insights from reflecting on each experience (Desjarlais & Smith, 2011; Apple et al., 2016). A significant barrier is the traditional assumption that insights are rare and so surprising that they spark a spontaneous "Aha!" or "Eureka" exclamation. Although these characteristics are true for some insights, the assumption explored in this paper is that insight generation is much more common and can become a generalized capability if guided by the Insight Methodology (IM), an innovative PE resource. Observations, especially in learning, performance, reflective practice, and research contexts, can be enhanced through a series of seven steps comprising the insight methodology previewed in Table 1.

Step 1 of the IM is to state a unique observation based on an experience in a situation that was important for a personal or professional goal. Personal experience memories are called episodic (Tulving, 1972) to distinguish them from more general types such as semantic (verbal) and procedural (psychomotor). Unlike other types of memory, which require special attention to become stable and retrievable, episodic memories form without effort and have a seamless quality that prompts a belief that they reflect reality accurately and therefore seem intuitively true. It is

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Table 1 The Insight Methodology

Steps	Description
Step 1: Observation	Unique detection that varies significantly from expectations or norms
Step 2: Intuition	The "Aha"/hypothesis (Insight) that is strongly believed to be true
Step 3: Implications	Inquiry about truthfulness of the intuition using various contexts
Step 4: Significance	Scanning of all possible uses to evaluate future potential value
Step 5: Solidification	Summarize the value of the insight for potential stakeholders
Step 6: Expanded Impact	Use creativity to push limits to open even more opportunities
Step 7: Articulation	Restructure communication to convey the importance of the insight

important to note that efforts to apply learning to learn principles to strengthen knowledge are also represented in episodic memory separately from the learning process.

Step 2, identifying an intuitive interpretation or hypothesis about the experience observed in Step 1, typically arises quickly from the initial observation (Kahneman, 2011) by answering the question "so what?" Heuristics, intuitive shortcuts, are used for making routine daily choices that are validated based on practical outcomes. In the IM, the difference is that the intent is to validate an intuition through analysis and reflection. The first two steps of the IM represent an essential starting combination because they are connected closely to lived experience as represented in episodic memories. The remaining steps direct attention to careful reflective assessment of the validity of subjectively generated intuitive hypotheses. Observation is always the gateway for intuitive insight generation but must be subjected to thoughtful reflection.

Implications are considered in Step 3 and is the first test of the validity of an intuitive hypothesis. Considering whether examples from varied circumstances and contexts could be relevant and effective in the way suggested by the intuition indicates that the idea holds up and works. Step 4, Significance, takes validation by example still further by asking three questions: how broadly the intuitive hypothesis may be applied, what potential value that it might produce, and what is its overall impact? Step 5, Solidification, directs attention to the potential of the generalized idea for varied users and contexts. Step 6, Expanded Impact, focuses validation on the creative potential of the hypothesis for prediction of new opportunities that include motives to increase capability to meet new challenges. Finally, Step 7, Articulation, is a restatement of the idea as a guide that provides action planning criteria and communicates the insight as a practice worth considering by a public audience.

Before exploring the seven steps of the IM in more detail, some background about insight as a construct will clarify why the IM is a creative new practice for increasing the frequency and power of insights. A more effective focusing of attention can lead to stronger intuitive hypotheses from observations and deeper reflection on generalized potential. The IM provides a process and structure for increasing conscious attention to the potential of each opportunity whether planned or unplanned. Widening one's range of perception and responding to the potential of experiences with flexible mindsets will support generation and clarification of more and varied insights for QoL and for movement toward one's ideal self during one's life journey.

Background

Types of Insights

The following specifications of insights are paraphrased from Lonergan's (1957/1992) classic epistemological treatment of insight.

1. A challenging or problematic situation stimulates the tension of inquiry that leads a questioning mind to find out "Is it so?"
2. The tension of inquiry is resolved by an insight that may be reported as an "Aha!" experience.
3. The insight represents a hypothesis about something, i.e., a new meaning articulated.
4. The insight as hypothesis is examined through reflection as something less than universal knowledge—it must be verified as true after skeptical evaluation of alternative possibilities.
5. The validating process involves acquired expertise, a truth-seeking mindset, and a self-correcting strategy of stepping back to avoid either being convinced too quickly or hesitating unreasonably.

The sense of "tension" Lonergan describes is a recognition that a general human motive exists that directs attention to inquire when uncertainty exists about the validity or

meaning of knowledge under consideration—if and only if its use will be relevant.

The seven steps of the IM can readily be inferred from Lonergan's model. The IM parallels and extends Lonergan's (1957/1992) insight characteristics by providing reflection steps for clarifying and articulating the meaning of an insight related to a situational observation. Insights arise quickly as intuitions that prompt conviction that they are correct (Leicester, 2016). Kahneman's (2011) distinction between System 1 and System 2, fast and slow forms of reaction to stimulus situations respectively, explains why initial belief should be tempered by skepticism. Leicester (2016), for example, recommends due skepticism about the feelings of conviction that accompany intuitions, that is, heuristic insights that provide a big-picture perspective or a possible interpretation but cannot account for all important details. IM steps 1 and 2 correspond to System 1 which is based on fast heuristics that stem from many daily situations requiring quick choices under time constraints. IM steps 3 through 7 require System 2 slow thinking to complete a fuller and more complex analysis. The IM guides users to appreciate the value of quick intuitions but also to apply reasoning steps for further validation. The IM concludes with an articulation of a full proposition that others can use in Step 7.

Many intuitions are triggered by something interesting that has happened that was at least partially brought into perceptual attention (Williford, 2005). Insights are also seen in cases of simple, one trial learning that produce intuitions that arise immediately, or they will fail to be sensed (Postman, 1963). Assessment of performances, meeting unexpected new challenges, and growth opportunities often stimulate intuitive insights experienced as new conceptualizations of how to explain an event or performance.

Three types of insights have special relevance for PE practitioners. Learning insights which are derived from formal learning. Gestalt insights stemming from creative composition changes of the meaning perceived from experiences. Finally, "Aha!" insights that fit the revelation moment when a solution arises suddenly from a combination of conscious and unconscious efforts and sources often with an incubation time added. In what follows, these three types of insights are discussed in further detail.

Learning Insights

Learning as a constructive process (McDaniel et al., 2021) involves the grasping of how to create knowledge models to meet current and future needs. Piaget (Hunt, 1963) observed children as they responded to his special setups designed to challenge their age-related capacities. Each small step in learning involves an insight that bridges the gap between what is currently understood and knowledge that is needed for new challenges. As Lonergan (1957/1992) emphasizes, all insights are motivated by the desire to know and can be applied even to very common learning experiences such as grasping the meaning of a chemistry or physics concept that links multiple sources of knowledge and application.

In support of learning insights, PE practitioners use the steps of the Learning Process Methodology (LPM) (Watts, 2018). For example, the purpose of using a reading log (Hurd et al., 2018) is to produce insights important for the reader's purpose, learning objectives, and performance expectations. The Learning Journal within the *Student Success Toolbox* (Pacific Crest, 2009) can be complemented by consciously using the IM steps to increase articulation of new insights from formal learning experiences. Further, within team roles, the Recorder's Report and the Reflector's Report each have a section asking the role performer to produce an insight. The recorder produces an insight on the content while the reflector produces an insight on the process.

Gestalt Insights

Gestalt psychology (Brownell, 2016) examines how perceptual elements become unified in new configurations. Williford (2005) emphasizes the value of gestalt insights, which are a good fit for many performance situations and have contributed importantly to the design of the IM. Selecting significant observations leads to intuitions that may have great promise for producing value that then can be applied in future situations. Observations typically include attention not only to a main focus but also to marginal or extraneous objects, talk, and actions, which can mistakenly be given more importance than they deserve. Thus, gestalt reinterpretation, based on reflection or assessment, is important for gaining the central meaning from an experience such as a performance. The PE framework includes tools and processes such as assessment, mentoring, and reflection to guide individuals to capture important information from experiences. With the focus of understanding directed to the central issues in what was observed, more useful insights become available for performance improvement.

During assessment, individuals are especially likely to experience insights from observations of others as well as themselves. Small changes that are meaningful are often missed if attention fails to be focused. Using criteria to focus on the behavior and characteristics of a situation that is continuously operating helps to identify either impediments or positive progress. These features may be nuanced or variable enough to elude detection without reliability of measurement, assessment, and criteria. When a learner or performer recognizes why and how to improve interpretation of what occurred versus what was intended, it be-

comes easier to improve knowledge, learning, and performance in all related situational challenges.

"Aha!" Insights

Problem solving has been the most common context in which sudden insight formation has been prominent. For example, a person doing a puzzle problem may struggle without making progress until the key insight comes to mind and the puzzle's solution becomes obvious. Famous examples of sudden insights include Archimedes' "Eureka!" reaction as he sprang from his bath after realizing that the volume of irregularly shaped objects, such as the crown he was charged to evaluate for purity of its gold, could be measured by creating a ratio of the weight of a pure-gold object with the weight of fake crowns that included other metals weighed in the same amount of immersion water. Another example from science is German chemist August Kekulè's dream about a snake biting its own tail. This dream triggered the insight that the structure of the carbon atoms in benzene must be a closed hexagon ring (Robinson, 2010). These examples show the link between observation and intuition. They suggest that incubation, the combination of conscious and unconscious mental processing, is significant when deeper integration of facts and intuitions leads to valid insights. The examples from the lives of Archimedes and Kekulè occurred within the expertise and experience of these eminent thinkers. Their insights were not of a random nature but were backed by many years of life experience.

Process

The Insight Methodology

The key to implementing the Insight Methodology (IM) is to become adept at noticing when learning moments, growth experiences, or impediments have been experienced because insights often are triggered by an intuition that something significant has occurred. Without additional attention, these moments are quickly lost. The IM was developed to support closer examination of observations that seem important or engaging, and intuitively persuasive as a representation of the active components in a context. Working through the seven steps of the IM increases the potential value of an observation due to the substantial meaning added at each step. The implications of an initial observation must be checked against various perspectives to guide exploration and articulation of why an observation could be expected to have value and significance. If the observation and associated intuitions survive an assessment test based on one's personal (broad) criteria and/or that of a skeptical critical thinking analysis, it is more likely to be valid for future applied contexts with similar characteristics and dynamics.

With an understanding of different types of insights, the succinct descriptions of the seven steps of the IM presented in Table 1 are fully elaborated in this section. The purpose of each step of the IM is identified, criteria for the step is delineated, and a discussion of the step is presented.

Step 1: Observation

Purpose

Capture observations that seem most relevant for understanding the what, why, and how of an experience or performance.

Criteria

a. The relevant observation is detected during an important activity
b. The observation is clearly and precisely described by creating a discovery statement.
c. What is conveyed can be thought about to elevate consciousness of what has happened

The aim of observation is to capture features of experiences that are likely to be of value for further development of specific capabilities. Can one practice to become more observant? Perhaps mindfulness training would be helpful as well as further development and use of the learning skill of self-monitoring. Mindfulness is an internal synthesis of attention and memory that uses all sensing, feeling, and perceptual abilities to expand awareness of self and reality (Nhât Hahn, 2014). Practitioners can also extend mindfulness to their experiences with students or mentees to deepen understanding of how to expand strengths and overcome impediments. Hülsheger et al. (2012), in a study of mindfulness effects on self-regulation at work, found that mindfulness supported nonjudgmental attending to emotional self-regulation during experiences which increased awareness of what was happening. Asking questions such as "Did you hear what you just said?" can return attention to episodic (personal experience) memories (Tulving, 1972) to extract more relevant details that clarify what happened.

Step 2: Intuition

Purpose

Rephrase the meaning of the Step One observation to accentuate its value. Put it into context from both a personal and a situational perspective by answering the question "So What?"

Criteria

a. The intuition arises as a clear and complete thought
b. Strong conviction that the intuition is true so there is no immediate skepticism

c. The intuition can be imagined and reinforced by multiple senses, e.g., sights and sounds are associated

As discussed earlier, in addition to "Aha!" insights, learning and gestalt insights are related to perceptual attention during experiences. By helping to clarify "marginal" memories (Williford, 2005), the IM, especially with mentoring support, can guide conscious attention to the more important details from an experience. Much of the PE work related to facilitation, assessment, and reflection shapes the conscious focus of individuals on how to strengthen specific responses in learning, performance, and growth contexts. Initial intuitions are highly important as starting points but require critical thinking analysis to establish their validity and value.

Step 3: Implications

Purpose

What makes the intuited insight important for any opportunity similar to the situation where the observation was originally made? What will change in the future and how will the change occur if the intuited insight is used in these contexts?

Criteria

a. Pick contexts that are familiar or similar to the situation producing the observation.

b. Consider what may be missing in the intuition statement.

c. Consider how to plan and prepare for incorporating intuited insight into performance.

d. Clarify "subjective" (affective) impediments, e.g., lack of openness to assessment from others.

Examples from scholarship in many fields of inquiry (Leicester, 2016) indicate that it is possible, but not always easy, to discover the difference between unfounded intuitive convictions and valid insights. Scientists, for example, must formulate reasoned hypotheses for experiments to test the validity of current theory. Firestein (2015) proposes that failures are the life source of scientific discoveries because a well-designed and implemented study that produces ambiguous results leads to many questions. The pursuit of alternative insights requires the affective skills to be open to shifts in methods or paradigms. He argues that science progresses based on insights from these "successful failures." Newton's theory of gravity, for example, still leads to accurate results for many classic problems from an earth-bound perspective, but Einstein discerned that Newton's theory failed to account for larger characteristics of space-time. He successfully proposed a valid alternative that better accounts for gravity and other phenomena. New insights are implicated in every research advancement.

Step 4: Significance

Purpose

Identify what makes the intuited insight important for additional opportunities associated with this type of situation? What additional changes might be possible in the future and what will support the evolution of such changes in individuals, e.g., will external facilitation be required? What is the most important reason(s) the intuited action has potential for the future for the specified performance, experience, or product? What is the potential value and impact for learners, performers, and growers?

Criteria

a. Pick contexts that are different or unfamiliar to the situation that produced the observation.

b. Describe the most relevant characteristics of the typical user(s) or audience.

c. Identify the top aspirational outcomes/value needed for desired impact of these users.

d. Distinguish "objective" features from "subjective" preferences.

Insights emerge from flexibly incorporating many possible elements through attention processes and divergent thinking (Yeh, Y-C, 2011; Gallate & Keen, 2011). Insights can be considered beliefs that seem convincing because they incorporate the elements of a situation into an approach that puts both positive and countering evidence into a new, holistic, gestalt perspective. An insight, therefore, can be conceptualized as a conviction that what one believes will successfully bear the brunt of further evaluation, even from a skeptical viewpoint.

Brady (2013) argues that emotional reactions are an important source for estimating the importance and value of beliefs in daily, common-sense reactions and decision making. A significant caveat is that information from emotions is not of the same caliber as that from the perceptual system. Nevertheless, increased awareness of one's degree of affective conviction about a belief is useful to stimulate further exploration of evidence, pro and con, that may result in validation of the insight.

Step 5: Solidification

Purpose

Reflect on the broader meaning beyond the current observation to synthesize with the implications and significance generated from the contexts in Steps 3 and 4. Clarify the level of broad-based meaning and value that this insight can have on the future for the possible audiences considered.

Criteria

a. Ask key questions about what it will take to strengthen the application for the contexts explored and audiences considered.
b. Generalize strategies or prototypes that are relevant for planning change of the type under consideration for the audience being addressed.
c. Identify mindsets, e.g., openness, needed for future success in these types of situations.
d. Integrate multiple levels of consciousness to capture diverse meanings and applications that will support growth.

An insight should provide enlightenment not only about its truth but about what investigative steps are reasonable for how to move forward to expand the formulation of the insight to other domains or situations. Davidson and Sternberg (1995) present a diverse set of approaches to insight generation for problem-solving. An assumption shared across these approaches is that a distinctive problem must be recognized or identified so the right configuration of elements can become obvious. For example, an "Aha!" insight will eventually emerge if the right elements are available. Schooler et al. (1995) distinguished between insight as an introspective process of understanding and as an experience of sudden conscious awareness of the solution to the problem at hand. They favor a perceptual interpretation, that is, insights are like the improvement of perceptions from distorted or hazy to clear. Stuyck et al. (2022) report a carefully controlled laboratory experiment in which insights were found to "pop up" from the unconsciousness as "Aha!" moments. Whatever the source of an insight, its value depends upon understanding how it brings together elements that are significant in multiple types of situational opportunities.

Step 6: Expanded Impact

Purpose

Think of other examples from new aspects of life that illustrate why growth will be increased by taking this action. Step back and rethink and capture the full meaning, essence, and significance of the insight: what, when, where, why, and how. Consider the 2019 CLS cognitive classification at its higher levels of innovating, creating, and researching.

Criteria

a. Identify expansion of values expected from incorporating the insight into novel experiences.
b. Recognize how self-awareness of the situation has potential to strengthen personal potential.
c. Recognize relevance for empowering one's life journey, self-growth journey, and movement toward ideal self.
d. Incorporate learning skills from one or more advanced (higher) process levels in the 2019 CLS.

Csikszentmihalyi (1996), in a qualitative research study of many individuals whose creative insights have had cultural impact, observed three individual types: *brilliant* individuals who have many intriguing and stimulating ideas; *personally creative* individuals whose ideas are perceptive and fresh but remain as subjective insights; and *publicly creative* individuals whose insights make a difference in a wider, cultural sense. Making a public contribution through one's creative accomplishments did not mean that these individuals were brilliant or could clearly communicate their insights. In fact, Csikszentmihalyi found them often lacking in charm and ability to fluidly discuss their creative processes. The need for the IM is supported by considering that individuals who have generated high-quality insights often cannot extend consciousness of their meaning to others.

Richards (2010) examines everyday creativity, which she suggests must meet two main criteria: originality and meaningfulness. It is important to consider the creative process a person uses as well as the creative outcome. Human capabilities to deal with the problems of life include imagination, improvisation, and innovation. Insights about "How?" (processes) are as important as "What?" (outcomes). Richards presents evidence that it is healthy to strive to be creative in present moments, referred to as "growth moments" in PE, to break out of constraining conventions and self-concern to an expanded and compassionate viewpoint. The IM provides a stimulus for expanding one's world by gaining fuller awareness of how insights carry generalized value across situations.

Step 7: Articulation

Purpose

Step back, rethink, and capture the full meaning, essence, and significance of the insight: what, when, why, how. Expand the depth and breadth of the value, impact, and significance of the insight from a sense of ownership that supports communicating one's judgment that this insight is fully believable and should be strongly considered for application by self and others. The communication of the insight is strongly dependent upon the clarity, succinctness, and accuracy of the label representing the insight.

Criteria

a. Present a coherent insight that can be rephrased for greater meaning.

b. Direct attention by providing a label that captures the central, significant idea or process.

c. Connect to QoL outcomes (e.g., happiness/satisfaction, meaning, and psychological enrichment).

d. Include criteria related to aspirational outcomes for the type of opportunities desired by the audience.

Imagine a sequence of assessments related to any of the PE practices and levels of consciousness, as "steps in new snow," a simple metaphor that makes it clear that each step should take the user of the IM to a new level. The steps have spaces between them that represent the advancement of learning as new opportunities come into view. Observations that capture these "spaces" are often fleeting; the IM guides articulation or realization that there is little future value to be gained from further articulation to discern meaning from the observation. Dewey (1938) labeled common sense insights as "ends-in-view" along a problem-solving path. It is not known ahead of time exactly how things will turn out, so it is wise to transform observations into insights about how to creatively revise expectations and to prepare for future moments that present opportunities for deeper understanding of a research theory or a common-sense end-in-view. The purpose of the IM is to help with capturing and more fully articulating the meaning of the steps in new snow that come along within the matrix of daily experiences.

The Insight Methodology in Practice

As discussed, the basis for insight creation is observation. This section provides two examples of insight generation using the IM. The examples presented in Tables 2 and 3 portray the use of the IM to produce insights from an observation.

In the first example, it was observed that it seemed possible to get more done than originally expected in an important area of performance for that week. At the beginning of the week, there was concern that getting things done would suffer from personal habits and rituals that have tended to impede planning effectiveness. The steps of the IM utilized to generate an insight from this observation are delineated in Table 2. The result of processing through each step is listed in column one with an explanation of the rationale for the response to the step presented in column two.

In many situations, a single observation can lead to more than one insight. An illustration of this possibility is presented in Table 3. In a learning experience, it the observation was stated, "My team failed to achieve 50 percent of our goals because it took 25 percent of the allotted time to agree on a less than effective working plan." From this observation two insights were generated as listed in Table 3. The first insight, dealing with preparing for team success is presented in column 2. The second insight stemming from matching and growing learning skills, is developed in column 3.

PE Practices That Support Insight Generation

The IM is an innovative tool within the PE framework that is designed for enhancing insights. It aligns with other PE resources related to creative insight generation. Insights are often enhanced through learning skills, delineated in the 2019 Classification of Learning Skills (CLS) (Leise et al., 2019). For example, incubation works well if one is patient while awaiting the emergence of a new insight configuration from subconscious cognitive processes. A significant way to produce insights from incubation is through the use of the Reflection Methodology (Desjarlais & Smith, 2011). Reflection, a process that helps to create meaning when one is stymied or stuck, is useful for stimulating greater openness to alternative perspectives that represent increased breadth or depth of understanding. Several steps of Desjarlais and Smith's methodology suggest that users should collect observations and related insights to deepen understanding of learning and performance experiences. The inclusion of the learning skill incubation in the 2019 CLS indicates the significance of drawing insights from subconscious sources. By mindfully working on complex tasks to the highest point possible with the time and energy available it becomes more likely that the passing of time, often overnight, will result in subconscious progress. Leise (2010) emphasizes the value of careful reflection by counseling interns to capture insights for self-regulating their communication to deepen their relationships with clients.

The SII Technique (Wasserman & Beyerlein, 2007), involving capturing strengths, areas of improvement, and insights of a particular situation, is a tool frequently used by PE practitioners for assessing a performance's processes and outcomes with the purpose of articulating an insight that can be generalized from discoveries about strengths and areas of improvement. The effectiveness of the SII technique depends upon reliably reported observations from performance situations. These reported observations align with Steps 1 and 2 of the IM. The Learning Process Methodology (LPM) (Watts, 2018) guides learners to use self-assessments, such as the SII technique, to produce insights from using the 13 steps recommended to engage learners. Insights often result in realizations that the skills used during the specific steps of a methodology to accomplish a process goal can become both learning to learn and growth insights with value across many learning and performance contexts.

Table 2 Insight Methodology—Example One

Steps	Insight	Explanation
Step 1: Observation	I can do more than I thought I could do.	After reviewing results from plans for the week, it became clear that unclaimed opportunities were present.
Step 2: Intuition	Doing more in the same amount of time requires two things: higher expectations and change in strategies.	The immediate intuition was that the impediments to achieving more during the week resulted from not setting high enough standards and neglecting to consider what better strategies could have been used in specific situations.
Step 3: Implications	Self-control of wanting to do things in creative ways has to have boundaries so that higher expectations of greater productivity, quality, and effectiveness can be achieved in accomplishing tasks.	The tendency to give more weight to personal preferences in use of time often restricts productivity. The idea that I do not have to conform to my own plans must be changed so that I give priority to my plans when they are well formulated. I need to reduce the number of tangents that aren't in the plan.
Step 4: Significance	There must be a balance between the plan to meet a goal and the ad hoc freedom to choose actions in the moment that have special significance. It is essential to reign in the divergent actions and to avoid improvising too much when these actions deviate from the plan.	By improving plans based on assessment it will become easier to value the role of planning in the production of significant growth and productivity in daily life situations.
Step 5: Solidification	Growth and change require a collaboration between the planning self and the acting self because the loss of what has been traditionally done is painful, especially when the gain has not yet materialized.	Plans, especially active growth plans, are challenging because they require not only attention to new priorities but also present emotional crossroads when old ways must be given up.
Step 6: Expanded Impact	When a new plan is reviewed, considering what was done using the previous plan, one can keep finding nuances to leverage past successes. Then the effort of growth will not be as painful, and the previous successes encourage planning and performing in roles with even more challenging goals.	Insights often occur at the "margins" of consciousness, that is, seemingly minor changes in performing sometimes are exactly what an expert would pay attention to. Being attuned to observations that are important for growth will support further growth and make it feel satisfying.
Step 7: Articulation	A well thought through plan for one's life and the building of an affective skill set that addresses the rate of change allows one to handle voluntarily moving away from past practices. When roles are clearly defined and laid out between the planner self and the doer self, it allows one to increase challenges, maintain ownership, and grow the capabilities to match the increased challenges without the pain of loss but rather with the power of growth.	A final articulation of an insight brings all the elements together. The first two steps bring an observation into view as an intuition. Steps 3 through 6 engage inquiry and imagination to validate, generalize, and expand the meaning of the initial starting point. By Step 7, a person owns the meaning and can communicate it to others using labeling and description to supports their efforts to apply it.

Table 3 Insight Methodology—Example Two (One Observation Leading to Two Insights)

Steps	Pattern # 1: Preparing for Team Success	Pattern # 2: Matching and growing learning skills
Step 1: Observation	My team failed to achieve 50% of our goals because it took 25% of the allotted time to agree on a less-than-effective working plan	
Step 2: Intuition	If I had reflected ahead of time on the personal value of achieving the goals, it is more likely that I would have identified how I needed to prepare for working within the time constraints.	If I had considered what combination of skills is needed for successful goal achievement, I could have facilitated the organization of the team within roles much more quickly.
Step 3: Implications	Taking the time to imagine the situation from multiple perspectives would have led to thoughtfulness about the meaning and value of the goals as well as about the practical implications of several possible ways of facilitating the team's efforts.	Realizing what learning skills are central to a project reduces the possibility of being blindsided by the complexity of a challenge and increases the likelihood of attention to what skills team members need to have success in their team role for the specific situation.
Step 4: Significance	Self-awareness of the importance of predicting future needs is a strategic mindset that influences preparedness based on selecting competencies to be developed to realistically meet the demands of a situation.	The available skill set of participants is a universal factor that will play a role in every situation that requires alignment of capabilities to achieve success.
Step 5: Solidification	The more the team members pre-think strategies prior to coming together, the quicker a single strategy can be developed that lays out the comprehensive approach.	Alternative capabilities based on multiple learning skill combinations are always available to consider, but realistic responding requires choice of one that is judged to be favorable for future growth in similar contexts
Step 6: Expanded Impact	Recognizing that personal values always are an integral and integrating aspect of planning will lead to setting higher expectations that will be seriously pursued in plans relevant to the values for multiple life contexts.	One's breadth and depth of learning skills, especially at the higher levels of the 2019 CLS, increases consciousness of the layers and variations of skills that comprise valuable capabilities needed to create quality in multiple life roles, i.e., both for performance and growth.
Step 7: Articulation	The process of getting on top of a situation involves being clear about 1) why you are involved 2) what you want to achieve 3) what you need to know 4) what areas of competency you need to improve 5) what are the measures of success 6) what is the plan to achieve success given the situational constraints	When project planning, identify the skill sets required for success. Any plan must include steps for ensuring that these skills are in place. A significant implication for recruiting a team is to assess team members for desired areas of skill development. Making sure that the team has or desires these skills also provides a clear growth opportunity for the members of the team.

Discussion

Expertise from experience in a given field explains differences in the quality and speed of generating insights. When the IM is internalized through experience, the speed with which insights can be generated increases. An experienced performance mentor has worked through similar scenarios with many individuals, thus, the rapidity with which they can move from observation to articulating a generalizable insight is surprising to those with less expertise. Similarly, SII assessment insights of experienced PE educators occur more quickly and powerfully than those of novice learners. The area of performance for mentors is more predictable than those of coaches. To be an effective coach (Van Slyke et al., 2023) requires a self-referencing openness to challenges to oneself to discover flawed assumptions and responses that reduce authentic reciprocity with clients. In any situation involving uncertainty, it is those with more preparation who perceive the larger or more important patterns of response that need attention, including in themselves. Observation, step 1 of the IM, requires some degree of expertise and collective experiences to allow ready recognition of what happened in situations that have future potential value worth exploring.

Incubation is often assumed to be a lengthy, unconscious process that results in rare and highly significant insights, e.g., Archimedes' "Eureka" experience. However, Lonergan (1957/1992), a philosopher, and psychological researchers (Chuderski & Jastrzębski, 2018) define what they mean by an "insight problem" but put no restrictions on the length of time needed for success of incubation in insight production nor on what combination of conscious and unconscious is best. The important principle is to purposely set aside mental time to process an observation (Klein, 2013) and to engage in thoughtful reflection. The movement in the IM process from observation in Step 1 to intuition in Step 2 may occur rapidly, especially for those with extensive experience. It may, however, take substantial time for less expert individuals or for more difficult problem contexts. The variation in incubation time is a natural part of the insight process. Self-managing of incubation, which is a learning skill in the CLS 2019, includes additional learning skills such as self-control of emotional reactions. For example, wanting to hurry the process rather than taking time to be mentally prepared to recognize insights and to plan possible next steps.

The general validity of the IM is supported by authors such as Wallis (1926) who discusses four steps in his analysis of the "art of reasoning": preparation, incubation, illumination, and verification. He clearly addresses the insight process but was concerned with discontinuities in reasoning methods that he observed early in the twentieth century including that industrial production of war technology was much more advanced than realistic reasoning about prevention of war. A cogent observation that remains relevant in the twenty-first century. As Wallis pointed out, changes in mindset are needed as part of becoming prepared to discover insights. East and Ang (2021) suggest that insight formulation may be increased by moving to more abstract reasoning to avoid fixedness in the specifics of a situation. Firestein (2015) argues that progress in scientific discoveries is associated with an assumption that each new experimental result will expose new areas of ignorance. The IM has been created to encourage the open mindsets discussed by Wallis and Firestein.

Conclusion

Insight has been of intense interest since ancient times and continues as an active focus of research and practice. Although the experience of producing an insight seems instantaneous, the IM represents it as a multiple-step process that can be consciously used to expand and deepen the meaning that can be extracted as insights from the observations made in many situations and experiences. A combination of unconscious and conscious psychological processes creatively merges to produce insights. Theories about insight share common factors including preparation from previous experiences and memories as well as time for processing the input information. Lonergan (1957/1992) emphasized learning as a universal context and a characteristic of the process of insight because the motive to know is central to human nature. Learning often occurs as a sudden reconfiguration of an experience, a gestalt, which brings divergent perceptual elements of a situation into a creative synthesis that is an intuitively convincing conclusion. Lonergan emphasizes the role of both context and mental preparation in the production of new ways of knowing about problem states as these occur in contexts such as the sciences, the social sciences, and in commonsense situations of daily living. In all contexts, whether formal or informal, insights can occur in learning, gestalt, and "Aha!" types.

Insight generation can be directed consciously even though unconscious processes are involved. Mentors and coaches, as experienced practitioners, often gain insights more quickly than clients because of their experience and expertise, including the use of the insight methodology. Other reasons for differences in insight creation are correlated with mental preparation and discipline in setting aside time to allow the insight process to work. The IM has been designed to support learning insights, creation of meaning from assessments of performances, improvement of interpretation of experiences, and elevated insights from major research or development projects.

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Evolution of Six Functions in the History of the Process Education Framework

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Abstract

The Process Education (PE) framework has evolved from an emphasis on the primary education functions of knowing, learning, and learning to learn to include emphasis on the functions of self-regulation of performance, which is a key to the function of growth, and on the self-determination of life decisions as the essential characteristic of the function of self-growth. This expanded vision has created the need for greater awareness of contexts and situations that offer opportunities for self-development of capabilities that have the potential to support growth related to one's ideal self. Conscious strengthening of distinctive mindsets and integration of learning skills across the domains of the Classification of Learning Skills (CLS) associated with each of the six PE functions has become central not only to the educational aims of PE but also to the personal life journeys of individuals. The enriched understanding of growth and self-growth as organizing constructs for the PE framework presents individuals, especially professionals, with new observations and insights about conceptualizing assessment and utilizing reflection to enhance Quality of Life (QoL) along one's life journey.

Introduction

Process Education (PE) is an educational framework based on a hierarchy of six functions that can be consciously actualized in distinctive ways. This paper provides detailed descriptions of the characteristics of each function in this hierarchy: knowing, learning, and learning to learn; performing, growing, and self-growing. The organizing construct of this hierarchy is self-growth (Jain et al., 2020), which requires conscious integration of insights from practices associated with the other five functions, potentially leading to unlimited, positive *capabilities.* This word choice is deliberate; capabilities are not capacities which are fixed or limiting (Nussbaum, 2011; Robeyns & Fibieger Byskov, 2021). Self-Growth plays a special role in the PE framework because it requires self-determined choices, actions, and self-regulation that all positively impact QoL and the trajectory of personal life journeys.

Background

Functions of Knowing and Learning

The PE framework has been developed as a system of educational interventions that addresses many of the barriers that frustrate professional satisfaction and restrict the range and quality of outcomes (Horton (2015; Apple et al., 2013). Since Bloom's publication of a taxonomy of cognitive educational objectives (1956), it has been clear that learning occurs at multiple levels and those levels must be consciously explored by engaged students. Bobrowski's re-casting of Bloom's taxonomy served to more closely match it to the methods and needs of PE users (2007). The Learning Process Methodology (LPM) (Krumsieg and Baehr, 1996; Watts, 2018) was created to delineate the process of creating knowledge as the result of using all the elements of an effective learning process. Learning at each level of Bloom's taxonomy requires use of all the learning steps in the LPM but with more complex knowledge at each step; the later steps of the LPM are more critical to learning success. Redfield and Lawrence (2009) provide conceptualization of how learning skills embedded in facilitated activities change the learner's process from production of knowledge to performance improvement.

Functions of Learning to Learn and Performing

Burke et al. documented the early emphasis on improvement of learning and performance through assessment in PE theory and practice, as early as the 1990s (2009). When applied to the practice of learning through the LPM, learning became something that could be improved. Sharing the LPM with learners meant that they could become aware of their own learning processes; learning the LPM is literally learning (how) to learn. Or, more succinctly, learning to learn.

Recognizing that learning and learning to learn are areas of performance (Nelson et al., 2020) was the next step in the development of the PE framework. Learning to learn provides a steppingstone from learning applied to create knowledge by using the LPM to the use of growth skills

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to increase quality of performance (Leisure et al., 2020) by using the Methodology for Developing Performance (MDP) (Van Slyke et al., 2020). The performance model (Elger, 2007) identified six factors that characterize any performance: context, level of knowledge, levels of skills, level of identity, personal factors, and fixed factors. The first four are related to individual self-determination and self-regulation. Personal factors such as health, family environment, and culture may be impediments in some situations or positive and supportive influences in others. Fixed factors such as physical characteristics, and to a lesser but important extent, personality traits, are not alterable but individuals can make choices that optimize performance.

Functions of Growing and Self-Growing

The attention on self-growth within the PE framework is an innovation that builds on Dweck's (2017) research on growth mindset. Growth capability (Hurd et al., 2021) makes it possible to improve life in ways that can lead to ever increasing life quality. Individuals who attain self-growth capability demonstrate the self-determination, enhanced self-regulation, and expansion of growth capabilities to optimize their ideal selves (Rogers, 1961). The factor of growth includes multiple dimensions that have been described by Hurd et al. (2021), including self-concept, personality, attitudes, and motivation. Growth can occur when one consciously recognizes how to match personal characteristics to valued growth opportunities and, equally importantly, how to avoid limiting characteristics. Other theorists with a developmental perspective have also recognized the importance of growth (Le Xuan & Loevinger, 1996; Baxter Magolda, 2009; Landau, et al., 2014; Lilgendahl & McAdams, 2011; Szu-Chi & Aaker 2019). While growth does not necessarily include the following, self-growth does: conscious integration of capabilities based on personal life (broad) criteria and development that motivates individuals to take initiative to actualize an envisioned ideal self.

Apple et al. (2021) describe 13 components of self-growth capability that also feature emphasis on consciousness of decision making across all six PE functions as they are needed for optimizing growth opportunities (Apple, Duncan, & Ellis, 2016). Maslow (1962, 1971) and Spady (2020) exemplify the general features and aim of the self-growth philosophy. As one makes decisions about how to respond to life's opportunities, desired outcomes include increased happiness, meaning, and psychological enrichment (Oishi, et al., 2020). The detailed modeling attained in the evolution of the PE framework increases the access to additional concepts and practices for daily living decisions that promote self-determination (Ryan & Deci, 2017) of one's life journey by consciously attaining changes in capabilities that strengthen self-concept in alignment with self-growth aspirations.

Need for the Six Functions

Everyone feels pressure from the challenges of living in an increasingly complex society (Lindsey, 2013) in which old ways and choices have been superseded by unexpected experiences such as the COVID-19 pandemic. Contemporary commentators (e.g., Brooks, 2019), have reported on these trends and recognized that personal change based on intrinsically motivated decisions and actions is essential for achieving lives of purpose, compassion, and meaning. These challenges put pressure on everyone, including educators, to adapt and change in creative ways just to maintain personal, family, and community well-being and status. Jus as growth can take place when characteristics are matched to opportunities, so too can constraints such as those caused by increasing social complexity and unexpected negative experiences, be turned into opportunities for growth if responses are consistent with personal aspirations and ethical ideals that are aligned with the needs of others. Self-Growth, as a kind of capstone, is contingent upon an open mindset focused on self-determined decisions and responses for expanding capabilities for achieving QoL outcomes and enrichment of psychological experiences through the functions of knowing, learning, learning to learn, performing, and growing.

Discussion

Interactions Among the Six Function Levels

As the PE framework developed, the buildup of resources and methods to support each of the functions has resulted in insights about the theoretical focus on learning and performing as well as potential application within curriculum design, facilitation, and mentoring (Apple et al., 2016). An important development, discovered from years of exploration of the learning process is the current emphasis on growth and self-growth as constructs that best characterize the optimization of PE practices. Jain et al. (2020) proposed the PE theory of self-growth as well as a methodology for following through its development. Supporting the import of this characterization, Spady (2020) and Brophy (2015) call for movement from a knowledge transmission mindset to one that attends to the needs of whole individuals as they deal with the complexities of life. The theory and resources generated in the past few years within the PE framework provide detailed modeling of self-growth as a practical endeavor for any individual.

Table 1 summarizes the relationships among the six functions from an assessment perspective. The labels in column 1 identify three levels of assessment focus: *determining,*

strengthening, and enhancing. The development of the three basic function levels of knowing, learning, and learning to learn, described in column 2, have been thoroughly explored in PE scholarship and summarized in Apple et al. (2016). Column 3 represents the relationships among performing, growing, and self-growing, which have been emphasized in PE scholarship since 2016. An important segue from learning to learn (cell 3) to performing (cell 4) is realization that an alternate label for learning to learn is *learning as performance* (Leasure et al., 2020), i.e., learning as a performance capability. Higher-quality performance capabilities are the foundation for strengthening of growth capability that have the further potential to use performances to produce greater QoL in self-selected areas. As growth itself becomes a consciously strengthened capability through actualization of growth action plans, it becomes the basis for self-growth, i.e., conscious self-direction of one's life.

Categories Used to Describe Functions

The relationship of the six functions to other aspects of the PE framework can be analyzed by considering how conceptual distinctions and applied strategies augment the efficacy of the first three functions—knowing, learning, and learning to learn—and integrate these as sources that support capabilities possible through the more complex functions of performing, growing, and self-growing. The functions are the most essential sources of capability development but can be optimized only if relevant meaning and supporting resources are brought into play in effective ways to generate desired outcomes from opportunities. Each of the following seven categories provides a source of richness and insights about how to amplify the role, features, and associated methods that empower the use of each function.

1. **Key Characteristics:** The PE framework has benefitted from discoveries about the multiple factors that characterize the fullest actualization possible for each function. The factors, steps, or components of each function have been documented by Bobrowski (2007), Watts (2018), Apple & Ellis (2015), Van Slyke et al. (2021), Hurd et al. (2021), and Apple et al. (2021). Being aware of the implications of the factors, steps, or components supports the potential for further expansion within each function.
2. **Performance Descriptions:** The added value of clarifying performance descriptions and labels for concepts and processes within the PE framework is threefold (Nelson et al., 2020). First, providing differentially specific operational details clarifies the intended nature, purpose, and role of what is described—and often represented with labels. Second, performance descriptions address the general nature of the elements and steps needed for observable (assessable) effectiveness and success. Third, they are an overview that directs attention to potentially useful PE resources such as learning skills, processes, and profiles. These resources may be directly identified but often must be inferred through reflection. Gaining insights from descriptions increases the potential to strengthen and enhance expectations, planning, and preparation for the demands of situations or contexts related to the functions described in this paper.
3. **Consciousness:** Consciousness of the differences in the functions must include insight about appropriate assessment and reflection methods. Reflection about the significance and value of specific use of a function can enhance awareness of how, why, and when specific preparation, steps, and decisions have potential significance in some situations but are likely to be of low value in others (Woolley et al., 2022). Meaningful reflection must delve into deeper or more generalizable insights that arise from more extensive experiences in using a function. Deeper reflection can significantly increase awareness of the dynamics of situations, especially regarding relationship factors, that require self-regulatory responses in real time (Csikszentmihalyi, 1993).

Table 1 Summary of Interactions Among the Six PE Functions

Levels of Assessment Insight	Basic PE Framework	Advanced PE Framework
Determining what is:	(1) *Knowing:* Being the evaluator of the quality of one's knowledge	(4) *Performing*: Being metacognitive while performing to improve performance
Strengthening what is:	(2) *Learning* (Enhancing knowledge): Being metacognitive when constructing your knowledge	(5) *Growing* (Improving future performances): Consciously integrating action plans to elevate capabilities
Enhancing the strengthening process:	(3) *Learning to Learn* (Enhancing Learning): Being the self-assessor of learning performance	(6) *Self-Growing* (Increasing Growth Capability): Consciously directing one's life by self-regulating intentionality

4. **Mindsets:** Beliefs and assumptions are important characteristics associated with how a mindset alters how an individual consciously attempts to apply any of the six PE functions in practical situations. Mindsets that are "fixed" (Dweck, 2017) create a sense of being "stuck" as an individual struggles without success to use a function for attaining a significant outcome—or fails to recognize when a different function is the key to forward movement. Having awareness of one's mindsets allows attention to be focused and refocused quickly and with a feeling of assurance or conviction about how to respond to situations (Dweck & Yeager, 2019).

5. **Role of Assessment:** The first goal of assessment related to uses of the six functions is validation that a consciously chosen function is suitable for meeting criteria set for the goal at hand. A second goal is assessing the quality of function use, including ability to self-regulate as conditions change from moment to moment. A third purpose of assessment is to test insights developed from reflection about how to optimize present use and further development in preparation for challenges to be expected as future opportunities arise. All three purposes can be efficiently met through qualitative assessments, such as the SII method of assessment (Wasserman & Beyerlein, 2007), but measures from external research can be incorporated to fit specific needs and criteria.

6. **Methodologies:** PE methodologies are expert models created and experientially tested that can support users across the six functions. Many methodologies that are available in PE publications and in faculty development offerings match well with specific frames of reference of each of the six functions (Apple et al., 2016). For example, the LPM provides steps in the process for creating valid knowledge and assessment can be done for enhancing progress and quality for each of the 13 LPM steps or for the summative results of a knowledge creation experience.

7. **Learning Skills:** The Classification of Learning Skills (Leise et al., 2019; hereafter "CLS 2019") includes many potential response alternatives at varied levels of complexity. This resource assists users in the goal of flexibly selecting and strengthening key skills to improve the quality of responses at any function level from something as straightforward as learning to prepare for an exam to something as complex as combining or integrating multiple functions during the phases of an artistic creation or a scientific investigation.

Analysis of The Six PE Functions

The nature of each function is linked to insights about these categories: key characteristics, a differential description, focus of consciousness, key mindsets, assessment and reflection strategies, associated methodologies, and sample learning skills. The focus of the PE framework is on creating not only the key concepts but also the tools and resources for using these functions to plan and actuate decisions which have the potential to increase value and quality for supporting the aspirations of individuals, groups, and organizations. Self-Growth plays an organizing role in the PE system approach, but it is important to emphasize the hierarchy of PE functions because higher-level decisions and actions require capabilities and achievements from the supporting lower-level functions. The capabilities from knowing, learning, and learning to learn are essential to mastery of capabilities at the performing, growing, and self-growing levels. The characteristics and mindsets of a self-grower are broader and more complex in scope than those of growing, performing, learning to learn, learning, and knowing.

Knowing

Key Characteristics:

Knowing is foundational to the other five PE functions because it is the memory resource that makes all the other functions possible (Tulving, 2005; Olney, 1998; Østby & Østby, 2018). Learning isn't possible without content (knowledge), performing requires working expertise, and a self-growth system is based upon extensive knowledge about growing and self-growing.

Performance Description:

What knowledge to acquire is a matter of choice but it must be learned deeply enough to support the development of capabilities at a required level. In other words, knowledge must be effective when applied within contexts involving the other functions. Knowledge has many dimensions including levels (Bloom, 1956), and various forms (Quarless, 2007) as well as dimensions of clarity and reliability in specific contexts. Information has become increasingly easy to obtain, a fact which can entice learners to stop short of creating knowledge that will serve their purposes beyond answering an immediate question. Self-knowledge must be learned through insights from personal experiences that clarify the differences between subjective knowledge (personal meaning) and more objective knowledge (validated from multiple perspectives). Self-knowledge is important not only for understanding oneself but for increased consciousness of personally meaningful and important learning arising

from other individuals and experiences. Many learning skills (Leise et al., 2019) require significant background knowledge in order to optimize their value and to avoid biases and impediments due to misunderstanding or misjudging in unfamiliar situations or when faced with greater challenges (i.e., not relying on guessing/predicting but having the required knowledge). Thus, having more and varied knowledge increases the potential for insights about significant learning details that make a difference in the attitudes, intentions, preparation, strategies, and goals associated with learning situations, performances, and experiences.

Consciousness:

At the level of knowing, consciousness is focused on ensuring that retrieval of relevant information is quick and accurate to support integration of desired skills and capabilities. Motivation to gain needed knowledge arises from consciousness that one lacks essential information needed for success. Additionally, beyond knowing what one does and doesn't know, consciousness of knowledge is being aware of one's bias, subjectivity, and fragility when using knowledge.

A Knowledge Mindset is Based On:

- Curiosity: Feeling motivated to pursue new kinds of knowledge because of the potential value
- Knowing you know: Staying with knowledge-seeking processes until confident that the results are what are needed
- Discipline expertise: Knowing that one can meet their own and others' expectations for the knowledge possessed in that discipline

Role of Assessment:

The criteria for knowledge focus on reliability, consistency, validity, and truth of what one knows. The assessment perspectives from the other functions often clarify the critical limits or boundaries of the knowledge required in activities, projects, or experiences that make up the varying degrees of complexity. Completeness of knowledge for a purpose often overrides evaluation of the reliability and validity of the same knowledge for alternative purposes.

Representative Methodologies:

Reading Methodology, Writing to Think, Problem Solving

Associated Learning Skills:

Checking perceptions, Recalling, Categorizing, Systematizing, Tagging, Archiving, Being curious

Learning

Key Characteristics:

Learning is the process of building knowledge structures that will address learning goals (McDaniel, 2022). The stages of this process for knowledge construction are consistent with varying knowledge and are supported by using learning skills (Leise et al., 2019) relevant to each stage.

Performance Description:

The role of learning is to produce valued knowledge from general or experiential information with the purpose of advancing one's success in specific contexts, including academic and life roles. Engaged and active learning (Nancarrow, 2007) is further enhanced through use of the Learning Process Methodology (LPM) (Watts, 2018) to guide conscious use of learning strategies for creating and assessing knowledge that will address purposes as intended within learning activities. Many skills from the 2019 CLS can be strengthened through use of the LPM's steps. The addition of new learning to one's knowing includes a metacognitive characterization of the depth and breadth of this knowledge including its level achieved, reliability and validity. Learners who become self-efficacious about the benefits of using critical thinking and other strategies designed into facilitated learning activities will advance faster and create greater meaning for life purposes (Soto et al., 2021).

Consciousness:

Learners build on their knowing by recognizing when new knowledge is needed. Intentional strategies are put into action to construct knowledge that is coherent with one's objectives and is complete and well-constructed. Awareness of the learning process allows self-assessment of both the new knowledge and the reliability of the process of its construction.

A Learning Mindset is Based On:

- Questioning: Continuously formulating questions that need to be answered through inquiry
- Seeking insight: Recognizing that each answer leads to new questions which can elevate meaning

Assessment and Reflection Perspective:

The criteria for learning are embedded in resources such as the LPM that provide steps for creating the knowledge one needs. Learning improves by assessing each step's contribution to meeting the learning goal. A summative assessment focuses on whether the learning goal itself has been achieved or the complete and valid

knowledge attained for a specific purpose using tools like a learning journal (Carroll et al., 1997). Assessment of learning from teachers, experts, peers, and self are all important for reliability and validation of learning outcomes.

Representative Methodologies:

Learning Process Methodology, Methodology for Generalizing Knowledge

Associated Learning Skills:

Redirecting focus, Defining characteristics, Validating completeness, Being open-minded, Inquiring

Learning to Learn

Key Characteristics:

Learning to learn results from increasing ownership, metacognition, and self-regulation of the learning process (Dunlosky & Metcalfe, 2009). The focus on certain groupings of learning skills to support advancements in learning performance during different steps in the learning process enhances learning capabilities.

Performance Description:

Learning to learn involves real-time self-regulation of choices and behaviors to improve learning efficiency, effectiveness, and productivity in optimizing knowledge from specific contexts to a wider range of conditions deemed important. Facility with metacognitive skills is needed to connect the learning principles and levels of knowledge (Bloom, 1956; Bobrowski, 2007) with the steps of the LPM and the learning skills (CLS, 2019) relevant to each step. This yields awareness of learning at its most basic but comprehensive. The 13 components of learning performance (Apple & Ellis, 2015) are relevant to learning to learn when we understand that learning to learn as equivalent to carrying out learning as a performance. Various tools, such as performance criteria and learning profiles (e.g., Profile of a Quality Collegiate Learner) then become resources for consciously assessing and reflecting on the learning to learn function (Apple et al., 2013; Apple, et al., 2016). A learning to learn mindset optimizes patterns of learning by integrating new techniques into analogous contexts so they can effectively transfer learning capabilities to more challenging and complex situations. There are many performance areas that align to and support learning performance (such as reading for learning, problem solving, preparing, generalizing, and self-assessing); using their performance descriptions provides richness to learning performances (Nelson et al., 2020).

Consciousness:

Learning-to-learn is conscious modeling of recently acquired skills for learning to improve its fit to both present and future contexts. Accurately capturing and interpreting what happened in specific situations yields practical cues and nuances that clarify effective approaches in different contexts and provide insights into how to flexibly integrate learning into performing (Leasure et al., 2020).

A Learning to Learn Mindset is Based On:

- Self-efficacy: Believing that one can achieve learning goals in challenging situations
- Productivity: Putting emphasis on timely outcomes that will have enduring value

Role of Assessment:

The criteria for assessment of learning to learn (learning as performance) are focused on how well the conscious use of learning skills enhances or accelerates the use of models or patterns of learning that will meet much greater challenges than one has met in the past. Self-Assessment of learning to learn is attuned to personal efficacy in increasing productivity and meeting new challenges in the future through developing clear action plans.

Representative Methodologies:

Elevating Critical Thinking Methodology, Creating Insights Methodology

Associated Learning Skills:

Transferring, Clarifying conditions, Strategizing, Identifying factors, Following principles, Capturing value, Ensuring fitness

Performing

Key Characteristics:

Performing is the integration of identity, working expertise, personal capabilities, and experiences within a defined context that meets the quality defined by a set of performance criteria. It is characterized by successful, self-regulated, real-time achievement of outcomes valued by the stakeholders of the performance.

Performance Description:

Performing is the transfer of patterns of action across real-time situations often represented by a performance description. To perform well requires integrated and deeply processed capabilities from the supporting levels of knowing, learning, and learning-to-learn (Leasure et al., 2020). The Methodology for Developing Performance (MDP) includes seven stages (20 steps) that aid in the cycle of planning, preparing, performing, assessing, and debriefing that supports continuous im-

provement of quality in performance, especially when a performance mentor is used. Performing with quality depends upon setting high expectations that are reliably achieved through conscious self-regulation and enhanced through assessment and reflection. Performance in this respect holds the potential for improvement in QoL for individuals.

Consciousness:

Performers focus on the fit of their actions in a performance context with the intended result made explicit through performance criteria. Past experiences, including those of unsatisfactory quality, keeps attention on performance criteria for self-assessing to improve through applied action plans that support generalizations of capabilities useful for achievements in future contexts. Learning skills that lend themselves to growth (Van Slyke, 2021) have been identified. Once these are elevated, a performer experiences much greater ownership over and efficacy in changing and transforming capabilities for new and varied performance purposes.

A Performance Mindset is Based On:

- Performance: Improving oneself through planning, performance, and assessment that supports the movement toward becoming a top performer in new contexts
- Self-Regulation: Improving performance by using assessment feedback to make corrective actions that will result in a more reliable process for achieving desired outcomes
- Impact: Extending performance improvements to make even greater differences (such as in QoL for self and others)
- Assessment: Focusing energy and efforts on improving future performances, instead of criticism of past performances, to move forward more directly and quickly in attaining higher quality in performance processes and outcomes (Jensen, 2007).

Role of Assessment:

The criteria for performing are focused on self-regulatory responses in real time to heighten quality defined by the performance criteria. The goal is to attain control of significant performance factors (i.e., the theory of performance) that could influence success in multiple future areas of performance and life roles by using performance measures, learning skills, growth skills, and performance mentors.

Representative Methodologies:

Methodology for Developing Performance, Self-Assessment Methodology, Teaming Methodology, Preparation Methodology, Mentoring Methodology, Communication Methodology

Associated Learning Skills:

Describing performance, Defining performance characteristics, Capturing evidence, Owning performance, Managing frustration, Analyzing performance

Growing

Key Characteristics:

Growth is characterized by expansion of the range and quality of the components of growth capability, including those supporting and strengthening self-concept, planning one's life, intensifying growth efforts, and enhancing performance improvement.

Performance Description:

Growth is consciously strengthening self-regulated use of expertise within new and challenging contexts in areas of performance important to one's envisioned life journey and QoL (Hurd et al., 2021). A grower must be open to consciously changing priorities to fit broad personal criteria important to one's life. Significantly improved QoL requires performance enhancements that can be generalized across performance areas through pivotal opportunities and by strengthening of a wide array of learning skills. Extensive research has resulted in a guide (Apple et al., 2018) for identifying and self-regulating professional characteristics to mitigate risk factors, thus making growth sustainable. An individualized QoL index is used for estimating and self-assessing growth in the most valued areas of life (King-Berry et al., 2021). Fifteen components of growth (Hurd et al., 2021) form a basis for conscious improvement of one's annual growth plan as well as for the more detailed work on more frequent opportunities that are needed for continuity of growth over time. As one broadens horizons of self-determined choices, weekly and daily self-regulation of actions must support this intentionality.

Consciousness:

Growers mentally explore opportunities, select activities, and continually assess the present so the future value of critical areas of performance improve QoL.

A Growth Mindset is Based On:

- Being future-oriented: Envisioning growth potential that will move one toward an ideal self through autonomous and conscious self-development
- Being positive: Imagining the potential of opportunities for improving the future builds confidence that one's growth will exceed the increase in life's complexity

- Acting strategically: Recognizing the potential value of focusing on new and effective approaches to important performance issues that encourage emphasis on exceeding current capability

Role of Assessment:

Assessing growth requires focusing on self-empowerment within and after moments of performance to actualize improvement in performance that can be transferred to future opportunities. The criteria and standards are used to energize efforts so that growth is stimulated for the current context which leads to greater performance in future contexts that integrates the future-oriented, positive, and strategic mindsets.

Representative Methodologies:

Methodology for Creating Action Plans, Methodology for Improving Quality of Life, Reflection Methodology

Associated Learning Skills:

Testing robustness, Optimizing a solution, Challenging assumptions, Changing behaviors, Applying criteria

Self-Growing

Key Characteristics:

Self-Growth is characterized by the continuity and synergy of life plans, shared life plans, and self-growth plans across time and situations to create a seamless pattern of movement toward an ideal self (Apple et al., 2021). Capabilities to support this movement include reflection, self-mentoring, use of mentoring skills, and the learning skills. This movement is enhanced through designing assessment, developing a self-growth plan, use of self-growth coaching, and integration of active growth plans.

Performance Description:

Self-Growth capabilities are developed with the purpose of gaining a more universal perspective than offered by the performance emphasis of growth capabilities. Kitayama et al. (2020) explored cross-cultural patterns of self-development with the conclusion that all cultures have analogous ideals of personal growth even though the self-growth process may be experienced in differing ways across cultures. Increased quality of outcomes and richness of relationships is correlated with expansion of one's consciousness of an ideal self as an aspirational expectation during one's life journey (Apple, et al., 2021; Jain et al., 2020). Self-Growers transcend present levels of purpose and quality in areas of life judged most valuable and give conscious attention to the potential for growth in each moment (Heath & Heath, 2017). Life experiences afford many opportunities that require the raising of expectations to motivate increased productivity. Self-Growth uses each other function in specific ways to orchestrate the strategies to support mindful growth in new capabilities for QoL, in the moment. To expand and deepen this mindful growth, self-growers use a variety of PE resources (Apple, et al., 2019) and tools including the Profile of a Self-Grower, performance measures for mentoring skills, and, most critically, the Self-Growth Methodology (Jain et al., 2020), which provides 26 steps in six stages for structuring a self-growth journey. Analysis of professional characteristics and risk factors (Apple et al., 2018), and structuring the ongoing implementation of weekly active growth plans provide the details of how the self-growth process is implemented. The self-growth function is the conscious synthesized use of the other five functions during each day's moments by reflecting on one's personal experiences and then planning growth for upcoming opportunities (Leise, 2022).

Consciousness:

By focusing on how to exceed current growth capabilities, self-growing is the intentional seeking, creation, and selection of opportunities with potential to improve QoL by strengthening one's growth capability. The aim is to increase happiness/satisfaction, expand one's life meaning, and make psychologically enriching outcomes more prominent.

A Self-Growth Mindset is Based On:

- Sharing: Enjoying the synergy that produces a greater QoL than that of two individuals living life separately
- Being quality-oriented: Seeking to improve upon current quality by increasing future quality in each activity, personal action, process, and life system
- Behaving ethically: Having a compassionate understanding (Nhât Hahn, 2014) by using an ethical system to move toward an ideal self, such as through commitment to universal principles of justice (Kohlberg, 1976)
- Being respectful: Believing that each person has unlimited potential and that it is the responsibility of a self-grower to interact with others in such a way that it leaves the other stronger and more capable of their own self-growth (Hintze et al., 2015)

Role of Assessment:

Insightfulness produced from reflection and self-assessment is most critical for validating that self-determined growth is optimal for one's life journey. The framework for self-growth assessment is broad (life) criteria that define one's most universal values and support the self-growth mindsets and daily decisions.

Representative Methodologies:

Self-Growth Methodology, Weekly Reflection Methodology, Weekly Scripting Methodology, Methodology for Creating an Active Growth Plan

Associated Learning Skills:

Being independent, Forecasting needs, Self-Mentoring, Being philosophical, Being compassionate, Establishing standards, Getting unstuck, Being metacognitive, Determining unmet needs

Conclusion

As new theory and practice insights emerged during the past 30 years to expand and integrate the elements and dimensions of the PE framework, six central PE functions evolved. The traditional emphasis of educators on disciplinary knowledge remains important but fails to recognize the problems that are often impediments for students who don't appreciate how their own affective and reflective skills are limiting their raising of the bar on their achievements. Learning through problem solving is an effective remedy for putting knowledge to practical use. However, even greater outcomes are possible if students learn how to learn by applying and strengthening growth learning skills from the CLS 2019, such as being persistent and setting priorities that match the aims in a situation. Learning as performance requires reflection to optimize conscious choices for producing increased quality in future performances.

Growth is a popular psychological construct that has been empirically validated in many studies since the late 1980s. However, it became clear from PE Learning to Learn Camps and college recovery courses that growth often is not part of students' mindsets even when their self-efficacy and productivity have increased. Even students who become conscious of how to learn within a specific context may not connect their new skills to changing how they choose to perform. Growth occurs from consciously strengthening performance quality in life roles (identities) and valued areas of performance with the goal of producing increased QoL. The mindsets associated with growth require greater awareness of future value of how increasing expertise in selected growth learning skills has the potential, by applying self-regulatory processes, for more generalized capability development. Although growth is necessary for self-growth, it is a more limited perspective. Self-Growth requires consciousness, in each moment, about how responding to growth opportunities that offer the greatest potential can lead to new and meaningful ways of attaining life aspirations. It requires courageous self-determination when decisions that can change the trajectory of one's life journey become possible in a situation. It leads to making opportunities happen that are needed to follow through in the direction of one's life plan for moving toward an ideal self.

Future investigation of the uses and implications of the six functions will be focused on how individuals use conscious self-determination and self-regulation to optimize their productivity. Self-Growth is now considered the organizing construct for the PE framework, which means that the other functions must be consciously used to develop and integrate the many capabilities relevant to living a satisfying life enriched with meaning. Each of the functions plays a distinctive role in each experience. As individuals consciously gain competencies by using the functions, they can increase the speed with which the lower functions are managed as parts of an integrated whole at higher functions.

As consciousness of function application is strengthened, it becomes important to seek new psychological insights from observations and measurements of how, and how well, PE practitioners self-regulate their commitments to actualize new capabilities as articulated in growth plans. Important lines of inquiry include: Do expressed intentions correlate with the production of desired achievements and life outcomes? Is reflection about observations powerful enough to generate empowering insights for directing future decisions and responses? Can opportunities be generated for expanding growth and self-growth patterns that have been established and for creating new and more enriching patterns? Can the opportunities and impediments related to interpersonal dynamics be self-managed while remaining an equitable actor in situations involving any of the six PE functions? Can the varied interpersonal and cross-situational meaning of actions and situative conditions be analyzed together to achieve a greater degree of objectivity? PE has expanded to include not only the expert design and facilitation of educational activities to produce "learning moments", but also the expectation that everyone must become aware of how intentions, insights, and interpersonal variables dynamically shape decisions, responses, and even motivation to actively create a life journey that has meaning for oneself while also increasing the well-being of others and the wider world.

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