A STEM APPROACH TO RESILIENCE
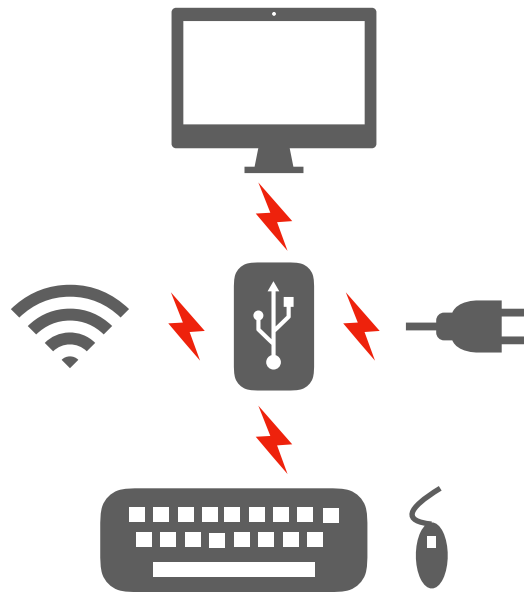
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Introduction

"It's not the stress that kills us, it's our reaction to it."
--Hans Selye

Meaning: What is stress? We might define stress as the body's response to demands or pressures. Some times stress can be helpful, as it gives us a push to get through a challenge. Unfortunately, stress can also be overwhelming, particularly if it continues over long periods of time. This relentless stress can and does affect us emotionally and physically.

Each of us responds to stress differently. Some people experience sleeplessness, irritability, or perhaps digestive problems (Alvord, Davidson, Kelly, McGuiness, & Tovian, 2018.; 5 things, n.d.). If stress continues and becomes chronic, then our immune systems become compromised and we are more prone to viral infections, heart disease, hypertension, diabetes, and mental disorders such as depression and anxiety (Krantz, Thorn, & Kiecolt-Glaser, 2013). At the extreme, suicide can be seen as a consequence of stress. Every forty seconds a person completes suicide somewhere in the world. (Suicide, 2014). In the United States, suicide is the second leading cause of death within the 10 to 34 year-old age groups (CDC, 2016). These are indeed disturbing statistics.

There are, however, protective factors to stress. Resilience, for example, has been used to examine the effects of stress in educational and in clinical settings. For our learning we define resilience as the development of skills needed to manage stress in an optimal way (Johnson, Wood, Gooding, Taylor, & Tarrier, 2011; Markel, Trujillo, Callahan, & Marks, 2010). Current resilience models favor social connectives, or social support, as protective for dealing with stress and reducing suicide risk (Gunderson & Grill, 2014; Klonsky & May, 2015; O'Connor, 2011; Stanley, Hom, Hagan, & Joiner, 2015). *The citation identifies the source of the information. Using the name and date in the citation, you will find more information provided in the Reference section that follows.*

The World Health Organization encourages us to pursue resilience at individual and community levels by recognizing the role of protective factors relative to suicide risk factors. Protective factors include development and sustainment of social support systems, spirituality as an access to a socially cohesive and supportive community with a shared set of values, and lifestyle practices of positive coping strategies, good self-esteem, self-efficacy and effective problem-solving skills. This includes the ability to reach out and find help when needed (Suicide, 2014).

Tragically, the stigma of illness frequently associated with behavioral health often prevents us from reaching out. Therefore, our focus here is an educational practice of developing mental armor rather than treating people as ill. This requires a commitment to honestly educate ourselves and explore behaviors and attitudes that may challenge long held beliefs on how we view others, our world, and ourselves.

About: There is a substantial body of evidence-based research supports both resilience and effective learning. The resilience skills presented here model this research as do the methods for learning these skills. We refer to these resilience skills as positive-coping skills because our intent is to take a personal challenge and create a more positive and less stressful outcome. We title these skills Belief, Persistence, Strength, Trust, and Adaptability for our learning. They serve as mental armor, a personal protective factor and to help us to sustain our social support systems.

In addition to putting on the mental armor to better protect us from stressful challenges, there is the added benefit that we are preparing ourselves for educational success. These skills and the learning methods also contribute to our academic success (Galatzer-Levy, Burton, & Bonanno, 2012; Hartley, 2011; Martin & Marsh, 2006; Martin & Marsh, 2008).

You might be asking how long is it going take me to learn the material and don this mental armor called resilience? The short answer is this is a lifetime exercise. Like any armor, you need to keep it shiny and that means sustaining your social support system and continuing to practice these and other positive coping skills. But, if the question is more about how long will it take to develop some awareness to becoming resilient, then about three to four hours is needed is complete the five positive coping skills of Belief, Persistence, Strength, Trust, and Adaptability. If you are limited to about two hours, then consider completing Belief and Trust and practicing a relaxation exercise, such as diaphragmatic breathing in the Strength skill. After completing the resilience skills, the technology exercise, *STEM Approach to Examine Resilience and Social Support*, can be completed in about an hour if you are comfortable with using technology, otherwise allot yourself one to two hours especially if you are working in a classroom setting where there is unfamiliarity with computer technology. Remember, that a healthy social support is one of the best protectors for stress extremes, including suicide. It therefore *essential* that you and others work with a partner while completing the exercises. The best results come from working with a group of people so that you and others can experience the power of social support systems.

All Skills	**Fast-track**
3 to 4 hours—Belief, Persistence, Strength, Trust & Adaptability	1 to 2 hours—Belief, Trust, & Strength (Diaphragmatic Breathing)
then	*then*
1 to 2 hours—STEM Approach to Examine Resilience and Social Support	1 to 2 hours—STEM Approach to Examine Resilience and Social Support

Like individuals, families can be considered unique entities, and can be resilient as they deal with the challenges in their collective lives (Patterson,2002; Walsh, 2015). Likewise, the skills that can assist and sustain individuals in their ability to bounce back from adversity can also support families in times of stress (Black & Lobo, 2008). In this way, helping family members to be more resilient in times of stress helps you. You and your family create a positive cycle of growth and strength.

Educators can also play an important role in enhancing student and family engagement, not only in academic success, but in reinforcing positive coping skills to better deal with stress (Epstein, Sanders, Sheldon, Simon, Salinas, Jansorn, … & Hutchins, 2018; McLeskey, Rosenberg,& Westling, 2017). Whether as a student, parent, or educator, collaboration leads to triumph. Collaboration can occur in many ways and one way is that of mentorship. A mentorship is where a more knowledgeable person helps to guide a less knowledgeable person. Certainly the more practice and experience we gain, the more effective we become as mentors. Yet, making the commitment to participate in learning these positive coping skills does provide you with the opportunity to return to your social support system, as a mentor, and practice these skills using the methods described in this text.

The text is intentionally organized as a series of resilience exercises intended to parallel the recommendations supported by the World Health Organization for suicide prevention (Suicide, 2014). The text can serve as a lesson plan allowing the five skills to be worked as a single session or as multiple sessions depending upon your time constraints. The lesson plan orientation should be familiar to educators and is also intended to be used by families and other groups.

How: Our learning method, called learner-centered teaching or learner-centered education, may be different than methods you have experienced in the past (Weimer, 2002). You are more likely to be engaged because you are asked to solve real problems, think critically, apply information, and combine knowledge to create solutions. You are asked to collaborate, that is, work with others to arrive as solutions. And, you are asked to reflect, analyze and review what you have learned to assess your own learning, that is, you

"grade" yourself. All of this gives you a lot more control over your own learning than you may have had in the past.

The learner-centered method provides flexibility and control to reach a level of learning that meets your expectations while we assure a level of competency that meets the program expectations or objectives (Martin & Marsh, 2006). How do we do this? Typical of a learner-centered setting, we use problem-based learning to solve those personal challenges you bring rather than us creating challenges for you to solve (Schmidt & Moust, 2000). Problem-based learning does not necessarily focus on problem solving using a single solution. Rather, problem-based learning encourages developing other desirable skills and attributes. This includes orderly problem solving through acquired knowledge, group collaboration and communication. By analogy, it is more about the journey than just getting to the destination. Learning is "facilitated" by questions that direct you, and those with whom you are collaborating, in a self-paced and real-world manner. Recall that key attributes of being resilient are having effective problem-solving skills and social support. Because, this is learner-centered, all of the instructional material is expected to shared amongst those participating.

The process begins by examining each resilience skill simply as a "flashcard" or memory aid. Each flashcard has a brief definition about the skill, why the skill is important, how to apply the skill, and a brief example demonstrating the skill being used to meet a challenge (Cobb & Bowers, 1999). These resilience skill flashcards are used across three exercises, or contexts, to improve transfer-of-learning and make the skills memorable, that is, easier to remember (Bjork & Richardson-Klavehn, 1989; Eich, 1985; Van Merriënboer, Kirschner, & Kester, 2003). Transfer-of-learning means that you are able to take learning from one situation and successfully apply it to another situation—this is sometimes very difficult to do. By sharing these flashcards with your friends and family, you develop yet another attribute of being resilient, that is, by working in a supportive community of people sharing similar beliefs and values.

Tell your story. In the first exercise, following the overview of the skill, we ask that you recall a past challenge where you have had success using something like the skill. For example, if we are examining the skill of Persistence, think about when you used something like Persistence to deal with a personal challenge. By answering the questions, you link the new skill format to a past success. This makes the new learning more memorable and you tend to look at the new learning in a more positive manner (Andersson & Conley, 2013; Race, Badre,& Wagner, 2009). This first exercise, *Tell your story*, helps you to develop self-efficacy, an attribute of being resilient. Self-efficacy may be defined as the belief in one's ability to complete tasks and successfully reach goals (Bandura, 1982; Margolis & McCabe, 2006).

Collaborate. In the second exercise, we ask that you work with an associate and consider a challenge you, your partner or someone you know is currently facing. Being able to effectively interact with another person is an essential part of the process of becoming resilient and sustaining your social support system (Barkley, Cross, & Major, 2014; Lochhead & Whimbey, 1987).

Pursuing social support encourages empathy, communication, and the act of reaching out to one another, especially so when problem-solving a challenge that has relevance or meaning to you. Empathy is often described as putting aside one's own beliefs and instead "seeing through the eyes of another" or "walking in the shoes of another." It is important to understand that empathy is not the same as sympathy, rather it is a critical thinking skill to help give you insight. Who you want to collaborate with is up to you, but initially consider someone with whom you are comfortable communicating such as a family member, friend, or associate. This might be someone you would consider as having a role in your social support system.

Your goal in this second exercise is to use the information provided on the resilience skill flashcard to

resolve the challenge. Write your challenge and your skill solution to the challenge. If you are working in a classroom environment, post your outcome with other groups' outcomes from the class. Through this learning process, you can observe how social support systems apply positive coping skills to solve real life challenges. In completing this second exercise, *Collaborate*, helps you to recognize the crucial importance of a social support system, bolsters your self-efficacy, self-esteem, empathy, and your ability to problem-solve and reach out to others (Bandura, 1993).

Own it. In the third exercise, we ask that you take a few minutes and reflect upon the skill you have just examined and describe the skill in your own words. If you are time limited, then reflect upon the skill, and, in a few of your own words, summarize in *writing* what this positive coping skill means to you. You are attempting to adapt the meaning of the skill to something that is more useable and memorable to you. If you are working in a group or classroom setting, post your responses, and recognize the awesome power of social support.

If you have ample time and are with a group of people, this exercise can be worked in three parts. The first part of the exercise is an oral warmup to assure everyone has a basic understanding. Ask the group "What is a word, words or a phrase that best captures the idea of the skill?" It can be helpful to have someone facilitate this oral exercise. The facilitator makes sure that everyone who wishes has an opportunity to orally describe the skill.

Next, reflect upon the skill, and, in a few of your own words, summarize in *writing* what this positive coping skill means to you. You are attempting to adapt the meaning of the skill to something that is more useable and memorable to you. If you are working in a group or classroom setting, post your responses, and recognize the awesome power of social support.

Finally, if more time is available, finding a memorable quotation can be a powerful way to personalize and adapt the skill. For example, the introductory Selye quotation "It's not the stress that kills us, it's our reaction to it." is a forceful reminder. And as Winnie-the-Pooh reminds us:

"A quotation is a handy thing to have about, saving one the trouble of thinking for oneself, always a laborious business."
– *A.A. Milne*

Adapting and writing these skill descriptions will make the skills more memorable. Again, if you are working in a group or classroom setting, post your results with others in the group and spend a few minutes looking at the responses. If you are doing this exercise with your family you can play "scavenger hunt," with each family member finding a quote they really like, and the family can vote on the one they, as a group, like the best. This can be an example of "gamification," but the real importance of completing this third exercise, *Own it*, is that it helps you to develop self-efficacy and empathy through observation of the diversity of results.

Want another method to help remember your skills and keep yourself motivated in the learning process? Consider using a length of paracord, or something similar, and as each skill is completed, tie a knot in the cord. At completion you have five knots. Recall that our social support system is one of our most important protective factors in our mental armor. So, when you share the skills with someone in your social support system, you tie the two ends of the cord together and you have begun the process of sustaining your social support system — five knots, one circle. Remember, too, the cord is reusable as are the resilience skills. Untie the knots and use the cord again to keep track of your skill

practice, or pass it on to someone in your social support system as a reminder. Consider, too, adapting the cord to better meet your needs, perhaps you might use beads. It is up to you as to how you want to adapt.

As we look back over the learning and what we wish to accomplish, our *goal* emerges. Our goal is to develop resilience by applying positive-coping skills to personal challenges and by developing and sustaining a social support system. There are a number of *key objectives* or *steps* that help us achieve that goal to include:

- Recognize the importance of developing personal resilience through positive-coping skills and social support system.
- Relate past challenges to resilient positive-coping skills.
- Apply resilient positive-coping skills to current challenges in conjunction with a member of your social support system.
- Redefine, in your own words, the meaning of resilient positive-coping skills.
- Create a personal social support system based on your needs with attention to why you are selecting those individuals.
- Identify how you will sustain that social support system over time.

Beyond our personal resilience needs, we need to keep in mind the needs of those in our community. The current evidence-based research encourages us to develop stress-resistant and resilient outcomes while promoting a sense of self, community, safety, self-efficacy, social connectedness, and hope (Hobfoll, Watson, Bell, Bryant, Brymer, Friedman, ... & Maguen, 2007). Through the practice of resilience, we have an opportunity to mentor our families and communities as well. In this way, we create a positive cycle of caring for others and us. It is this cycle that gives true meaning to who we are to ourselves, other people, and the world.

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BELIEF

Belief affects attitude. Changing your belief changes your attitude.

Meaning: What is Belief? The way I perceive things is shaped by my beliefs. That means that my beliefs control my actions and my attitude. My attitude is the way I feel about something. How might this play out? Perhaps, my neighbor's dog has been barking for an hour. My *attitude* might be one of annoyance based on my *belief* that the dog barks for no reason. Or, my *attitude* might be one of concern based on my *belief* that the dog is barking because something is justly wrong. Do you see that the way I perceive the event is shaped by my belief? Do you see that my *attitude* is the consequence of my *belief*?

So, when I encounter a personal challenge, I have choices to make. Sometimes I can alter the challenge to make it more positive or more manageable. Many times, however, the challenge may appear to be unalterable. I then have to alter a personal belief so I develop a better attitude dealing with the challenge. I have to ask myself if the belief I currently have is self-defeating and perhaps based on some fear. What then might be a more positive, yet realistic, belief that I can consider. This is not always easy or immediate. The reality — I need to embrace the suck. The suck being that a belief is an idea or principle that I judge to be true, even if it is self-defeating. It takes a lot of courage to make change. But, once I have made the decision to develop a more workable belief, I have also made the decision to be a survivor rather than a victim. Then too, I may find that with a better attitude, I can also make the challenge more workable for me. I am in control.

Again, consider the barking dog. My attitude may be one of concern based on my belief that the dog is barking because something is justly wrong. If I check and find that the dog has tipped over its water bowl and wants water, then my belief is justified and reinforced. But, if I see that the dog is barking for no apparent reason, then do I maintain the attitude of annoyance, perhaps even anger? I reflect on that *attitude* and recognize that the *belief* may be self-defeating. I understand that changing a belief that may be self-defeating is not always instantaneous. I need to persist in my thinking to develop a more positive belief and, consequently, a better attitude. My new belief you ask. How about birds chirp, cats meow, and dogs bark to communicate.

I have a question for you. How do you manage your beliefs?

Why: Your beliefs control your actions and the way you feel about something, your attitude. You can alter your belief to change your perception and better deal with your challenge. Beliefs, whether positive or negative, can have a profound impact on physical and psychological health.

How: Approach your challenge with a realistic view. Can you change the challenge to make it more controllable? If the challenge appears not changeable, then a change of attitude is possible by changing a belief.

- Consider your challenge. Is the outcome changeable? If so, then identify a more positive yet realistic outcome.
- Or, if the outcome is not changeable, then identify your worst fear. There is a belief that is supporting that attitude. Identify a more positive belief. Consider the steps needed to bring about the change to a more positive belief.

- Sometimes a challenge may require a change of belief before a more positive outcome can be found. And, sometimes changing the outcome of a challenge may be necessary before finding the more positive belief.

Example: Because of a fracture, my arm is immobilized in a cast. This condition is not going away for several weeks and I can't change it.
☐ My challenge is how to deal with a cast on my arm for several weeks.
☐ The outcome is not changeable, so I will focus on a change of belief.
☐ My worst fear is that I can't do everything I want to do.
☐ I recognize that my belief is self-defeating because the belief appears to be "all or nothing" thinking.
☐ I seek the more positive belief that there is still opportunity to do some of what I need and want to do.
☐ I recognize now that I can also improve my outcome with a support system and attainable goals.

If you don't like something, change it. If you can't change it, change your attitude.

— Maya Angelou

Tell your story: Recall a past Belief challenge

Objective: Completing this exercise will help to link this new learning to prior learning, something you did with some success in the past, so as make Belief more memorable.

Perception is shaped by belief. Changing your belief changes your perception, giving you control, inner strength and courage to make change.

A belief can be described as an idea or principle that we judge to be true. Some people believe the Earth is flat and others believe it is round. We become attached to our ideas, our beliefs, whether they are beneficial or self-defeating. This is because our beliefs affect how we perceive things and subsequently affect our behaviors, particularly so as we face challenges. What I may experience as stressful may not be that bothersome to you. And yet, what is stressful to you may have little impact on me.

The good news is that self-defeating beliefs can be modified into more positive beneficial beliefs (Burns, 1999). Let us look at Belief as a resilience skill. Read the Belief flashcard. Recall a past personal challenge where you successfully used the skill of Belief or something similar to Belief. Work on answering following questions 1 and either 2 or 3 depending upon your challenge. Feel free to work individually or in collaboration with another person on this exercise. Working with another person can develop problem-solving skills when one person acts as problem solver and the other a listener. The problem solver reads the problem aloud and describes a potential solution. The listener follows the problem solver's steps attempting to catch any errors (Lochhead, & Whimbey, 1987).

1. What was your challenge?
2. If you **were able** to change the challenge to something more positive or workable:
   1. What was your more positive outcome to the challenge?
   2. Did you then find you had a more positive belief and a change of attitude?
3. If you **were unable** to change the challenge to something more positive or workable:
   1. What was your worst fear or concern?
   2. Now the tricky part. Can you identify the self-defeating belief that caused your fear or concern?
   3. What was the more positive belief that you used to replace the self-defeating belief? If you are struggling to identify the self-defeating and positive beliefs, then describe how you

worked around the fear that confronted you. That description will help to identify the more positive belief you used.

4. Did you then find you were able to find a way to change the outcome to make it more positive and manageable?

Collaborate: Apply Belief to a current challenge

Objective: Completing this exercise with another person will encourage communication, empathy, and the ability to reach out while problem-solving a relevant challenge.

While positive coping skills are important to self-resilience, these skills also become very important to sustaining the social support system. That is, by making yourself more resilient you also make your social support system more resilient too. For that reason, we strongly encourage you to do this exercise with another person so that you become aware of how to work with people within a social support system, people who will work with you on real life challenges. Recognize too, that working with others is demanding, particularly so for those of us dealing with Post Traumatic Stress whereby we tend to isolate ourselves from others. Beliefs, whether positive or negative, can have a profound impact of our physical and psychological health (Schwarzer, 2014).

Consider a challenge either you or perhaps someone you know has encountered. Write the challenge in as much detail as you feel necessary to allow you, and your associate, to make a decision as to whether you can alter the challenge outcome so it is more manageable. Or, if the outcome appears to be not changeable, a change of attitude is possible by changing a belief (Bandura, 2001, Reivich & Shatté, 2002). Though this stressful challenge may be quite dire, we can still change the way we react to the situation and have some healing value emerge from the process (Tedeschi & Calhoun, 1996). Refer to the Belief flashcard, especially the example, to get an idea on how you might write your responses to the following questions.

1. What is your challenge?
2. Are you *are able* to change the challenge to something more positive or workable:
    1. What is a more positive, yet realistic, outcome to the challenge?
    2. Are you able to recognize a more positive belief and a change of attitude?
3. Are you *are unable* to change the challenge to something more positive or workable:
    1. What is the worst fear or concern?
    2. Can you identify the self-defeating belief that caused the fear or concern?
    3. What is a more positive belief that can replace the self-defeating belief? If you are struggling to identify the self-defeating and positive beliefs, then describe how you could work around the fear or concern. That description will help to identify the more positive belief used.
    4. Are you now able to find a way to change the outcome to make it more positive and manageable?

If you are working within a classroom environment, consider posting your outcome with other groups' outcomes from the class. Through this learning process, you can observe how social support systems apply positive coping skills to solve real life challenges.

Own it: Reflecting on Belief

Objective: Completing this exercise will make the skills more understandable and therefore more workable for you.

1. You have applied the Belief skill to an instance that had occurred in your past. You have also applied the skill as group problem-based-learning to a current challenge. Now, reflect upon the skill. What is a

word, words, or a phrase that best captures the idea of the skill of Belief. This is a good *oral* exercise in a group or classroom setting to determine if everyone is understanding the concept. It can be helpful to have someone facilitate this exercise. The facilitator makes sure everyone has an opportunity to orally describe the skill.

2. Reflect upon the skill of Belief and, in a few of your own words, summarize in *writing* what this positive coping skill means to you. You are attempting to adapt the meaning of the skill to something that is more useable and memorable to you. If you are working in a group or classroom setting, post your responses, and recognize the awesome power of social support.

3. If more time is available, finding a memorable quotation can be a powerful way to personalize and adapt the skill. What would you use as a memorable quotation for the this skill? You are attempting to adapt the meaning of the skill to something that is more useable and memorable to you. If you are working in a group or classroom environment, post your results with others in the group and observe the results and recognize the power of diversity.

Excellence is not a skill, it is an attitude.
—Ralph Marston

How am I doing?

Objective: Completing this assessment will provide opportunity to monitor progress, adjust your learning, develop self-efficacy, and improve self-esteem.

The following assessment allows you to monitor learning and track your changes as you continue to explore resilience through positive-coping skills and social support. You are encouraged to compare these ongoing assessments to see how you have adapted to the learning and resilience.

Learning Objectives				
Assess how well the learning objectives are working for you. Answer by checking only one response to each of the following objectives.	👎👎 Do not recall doing this	👎 Not a useful exercise	👍 Useful	👍👍 Very useful
Relate a past challenge to the Belief resilience skill.				
Apply Belief, to a current challenge, with a member of your social support system.				
Redefine, in your own words, the meaning of Belief.				
Recognize the importance of developing personal resilience by using positive-coping skills and social support system.				

Change of Behavior				
Assess how much you have changed. Answer by checking only one response to each of the following.	👎👎 **Worstened**	👎 **No change**	👍 **Improved**	👍👍 **Much improved**
Ability to apply positive coping resilience skills to personal challenges.				
Ability to reach out to a social support system to better deal with personal challenges.				
Ability to problem solve when dealing with personal challenges.				
Improvement of self-efficacy, the ability to persist in meeting a goal when dealing with a challenge.				
Improvement of self-esteem.				

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PERSISTENCE

Persistence is facing a challenge with the belief you will succeed.

Meaning: There is a journey ahead. It is the journey of personal change. I must persist to bring about change. There is no honor in failure earned through lack of effort. I deny myself and I deny those with whom I travel through life to thrive and grow. If I wish to succeed, I need to persist.

There is something very powerful about writing a goal. It requires me to take the time to organize my thoughts into a statement that is brief and understandable. The goal has become worthy of my time and effort. I believe I can persist.

My preference is to keep my goal statement brief and to-the-point. Reduce a complex task into a simple phrase. I don't need to worry about the details, not yet, anyway. Put limitations to the goal. Limitations make the goal manageable allowing me to determine the what and when of completion. "Hike a section of the Appalachian Trail over one week." Is that doable I ask myself. There is nothing to be gained in setting myself up for failure. I want to make sure I can persist.

I decide how I will complete the goal, step by step. The process is systematic. Each step brings me closer to the goal. I write each step in a manner that permits me to determine when it has been completed. The step is measured by limitation. "Weather permitting, today I will hike 15 kilometers in 8 hours to arrive at the next campsite." I can check it off. I can mark progress toward goal completion. I make sure I will persist.

Marking progress builds belief, commitment to ensure I complete the goal. I therefore write a number of steps to both mark progress and provide direction. The goal and the steps become my map. When I have completed all of the steps, I have attained the goal. I have persisted.

Persistence is facing a challenge with the belief you will ultimately succeed. What is your challenge? How will you persist? Have you written your map?

Why: Persistence encourages you to make change, mark your progress, and build belief that you can reach your goal.

How: Consider creating a realistic goal and the steps needed to reach the goal so that when all of the steps are completed, you have attained your goal.
- Consider your challenge and recognize the importance of believing you can meet the challenge.
- Creating a goal is way to build the belief you can meet the challenge. The goal must be reachable within a realistic time limit.
- The steps describe the actions that are needed to reach your goal. Create as many steps as needed so that you can see the progress you are making. You persist by building belief in yourself.
- Remember to reward yourself as you persist.

Example: I have a project to do and need a plan to complete it on time.
☐ The challenge is to complete a project.
☐ The goal is to "Create a Project Time Plan."
☐ Break the major parts of the project into smaller steps to better identify the tasks and how much

time is needed to complete each part.
☐ Assign a due date to each project part.
☐ Assure there are enough steps so that progress can be easily seen.
☐Monitor progress and remember to reward yourself as progress is made.

Success is not the absence of failure; it's the persistence through failure.
— Aisha Tyler

Tell your story: Recall a past Persistence challenge

Objective: Completing this exercise will help to link this new learning to prior learning, something you did with some success in the past, so as make Persistence more memorable.

Persistence is facing a challenge with the belief you will ultimately succeed.

Read the Persistence flashcard. The skill of Persistence is defined as "facing a challenge with the belief you will ultimately succeed." Self-efficacy is defined as "how well one can execute courses of action required to deal with prospective situations" or, more simply, belief in one's ability to complete tasks and successfully reach goals (Bandura, 1982, p. 122). Notice that self-efficacy measures your Persistence. The more you persist the greater will be your self-efficacy. Being able to create an attainable goal and the steps to achieve that goal has been found to increase our sense of self-efficacy, leading to a greater likelihood of persisting and attaining success (Bandura & Locke, 2003; Bandura & Schunk, 1981; Gist, 1987; Locke & Latham, 2002). Keeping in mind this Persistence and goal setting relationship, recall a past personal challenge where you successfully used the skill of Persistence or something similar to Persistence. Work on answering the following questions. Feel free to work individually or in collaboration with another person on this exercise.

1. What was your challenge?
2. What made you believe you could meet the challenge?
3. Did you create a goal as a way to build the belief you could meet the challenge?
4. Was your goal made reachable within a realistic time limit?
5. Did you write a goal statement?
6. Did you write the steps to describe the actions that were needed to reach your goal?
7. Did you include enough steps so that you could mark the progress you were making?
8. Did you remember to reward yourself in some way as you persisted?

Collaborate: Apply Persistence to a current challenge

Objective: Completing this exercise with another person will encourage communication, empathy, and the ability to reach out while problem-solving a relevant challenge.

We strongly encourage you to do this exercise with another person so that you become aware of how to work with people within a social support system, people who will work with you on real life challenges. Consider a challenge either you or perhaps someone you know has currently encountered.

Write the challenge in as much detail as necessary to allow you, and your associate, to answer the following questions. Write your responses.

1. What is your challenge.
2. What makes you believe you can meet the challenge?

3. Will you create a goal to build the belief that you can meet the challenge? How you perceive the goal is important to the outcome. Those who perceive the goal to be a challenge show better performance than those who perceive the goal to be threatening and leading to failure (Drach-Zahavy, & Erez, 2002). Setting more difficult goals, such as "improve upon past performance," leads to better performance than no goals or vague goals, such as "do my best" (Strecher, Seijts, Kok, Latham, Glasgow, DeVellis, ... & Bulger, 1995). The SMART acronym captures some of the elements of successful goal setting from a management context. That is, goals are *Specific* (have a defined intent), *Measurabl*e (limits are established), *Assignable* (who is involved), *Realistic* (attainable), and *Time* related (have an expected completion) (Doran, 1981).
4. Describe your goal.
5. Is the goal attainable?
6. Is the goal reachable within a realistic time limit?
7. Describe the steps that are needed to reach your goal. It is important to develop a realistic goal along with the smaller, more manageable, informative steps required to attain the goal. These steps have purpose. Steps can help eliminate goal uncertainty by providing limitations to a broader goal statement while introducing more flexibility in attaining the goal (White, Kjelgaard, & Harkins, 1995; Zelen, 1955).
8. Do you have enough steps to mark your progress and build belief that you can persist?
9. How will you reward yourself as you persist?

If you are working within a classroom environment, consider posting your outcome with other groups' outcomes from the class. Through this learning process, you can observe how social support systems apply positive coping skills to solve real life challenges.

Own it: Reflecting on Persistence

Objective: Completing this exercise will make the skills more understandable and therefore more workable for you.

1. You have applied the Persistence skill to an instance that had occurred in your past. You have also applied the skill as group problem-based-learning to a current challenge. Now, reflect upon the skill. What is a word, words, or a phrase that best captures the idea of the skill of Persistence. This is a good *oral* exercise in a group or classroom setting to determine if everyone is understanding the concept. It can be helpful to have someone facilitate this exercise. The facilitator makes sure everyone has an opportunity to orally describe the skill.

2. Reflect upon the skill of Persistence and, in a few of your own words, summarize in *writing* what this positive coping skill means to you. You are attempting to adapt the meaning of the skill to something that is more useable and memorable to you. If you are working in a group or classroom setting, post your responses, and recognize the awesome power of social support.

3. If more time is available, finding a memorable quotation can be a powerful way to personalize and adapt the skill. What would you use as a memorable quotation for the this skill? You are again attempting to adapt the meaning of the skill to something that is more useable and memorable to you. If you are working in a group or classroom environment, post your results with others in the group and observe the results and recognize the power of diversity.

If you are going through hell, keep going.
—Winston Churchill

How am I doing?

Objective: Completing this assessment will provide opportunity to monitor progress, adjust your learning, develop self-efficacy, and improve self-esteem.

The following assessment allows you to monitor learning and track your changes as you continue to explore positive-coping skills and social support. You are encouraged to compare these ongoing assessments to see how you have adapted to the learning and resilience.

Learning Objectives				
Assess how well the learning objectives are working for you. Answer by checking only one response to each of the following objectives.	👎👎 **Do not recall doing this**	👎 **Not a useful exercise**	👍 **Useful**	👍👍 **Very useful**
Relate a past challenge to the Persistence resilience skill.				
Apply Persistence, to a current challenge, with a member of your social support system.				
Redefine, in your own words, the meaning of Persistence.				
Recognize the importance of developing personal resilience by using positive-coping skills and social support system.				

Change of Behavior				
Assess how much you have changed. Answer by checking only one response to each of the following.	👎👎 **Worstened**	👎 **No change**	👍 **Improved**	👍👍 **Much improved**
Ability to apply positive coping resilience skills to personal challenges.				
Ability to reach out to a social support system to better deal with personal challenges.				
Ability to problem solve when dealing with personal challenges.				
Improvement of self-efficacy, the ability to persist in meeting a goal when dealing with a challenge.				
Improvement of self-esteem.				

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STRENGTH

Strength grows from proper nutrition, exercise, relaxation and sleep.

Meaning: Life is constantly changing. The change may be forgiving or it may be an unrelenting challenge. The journey of change demands strength. Less is to flirt with failure.

Fitness is the strength to deal with life challenges. I can choose to be fit, to build strength to carry myself through those challenges that bring about change. Fitness is awareness of mind and body, of self and needs. Fitness is forgiving of my fails, those times when my vision is poor and my footing is unsteady during storms of violent change. Fitness, too, lets me celebrate my wins. It is my ally on my journey through life.

Strength is a chain of links. Proper nutrition, exercise, relaxation, and sleep form the links in that chain. I recognize that I have almost complete control of diet and exercise to build strength. I begin simply by keeping nutritious foods, such as fruits, in plain view. I find an exercise that is an enjoyable escape from stress. I make time to relax and sleep. I monitor my progress. I see positive change. I am motivated. Strength is about self-care. The path to quality of life requires the body be strong so that the mind is able.

Strength sustains me on my journey of change. My journey is only bound by my beliefs. There are limits, though. I understand my strengths and my weaknesses. I recognize that my strength has limits. The journey will end. I will celebrate with my ally, fitness. Fitness is strength. Strength is a chain of links.

How goes your journey? Have you met your ally?

Why: Practicing a healthy diet, physical exercise, relaxation, and good sleep habits improves physical, emotional, and mental well-being. When you feel good, challenges are more easily managed. Fundamentally, strength comes down to good self-care, an essential for first responders.

How: Find and practice plans for diet, exercise, relaxation, and sleep to fit your lifestyle while meeting the goals of good nutrition, aerobic exercise, stress reduction and adequate sleep.

- Consider your challenge and how it relates to diet, exercise, relaxation and sleep.
- Find and practice a healthy diet that fits your lifestyle yet lowers your health risks. Consider researched plans such as MyPlate, Healthy Eating Plate, Mediterranean, and DASH (Dietary Approaches to Stop Hypertension).
- Find and practice a physical exercise plan that fits your lifestyle and provides at least 2 hours and 30 minutes of moderate-intensity aerobic physical activity ideally spread evenly throughout the week.
- Find and practice a relaxation exercise, such as slow diaphragmatic breathing, progressive muscle relaxation, social resilience, and mindfulness-based stress reduction.
- Practice good sleep hygiene by keeping a consistent sleep–wake schedule, exercising daily and eliminating long naps and naps within a few hours of bedtime.

Example: I get anxious before and during high-stakes tests and that prevents me from doing as well as I could do. I need to find and practice a relaxation exercise.
☐ The challenge is to be relaxed before and while taking tests.
☐ Consider an easy relaxation exercise, such as diaphragmatic breathing, an exercise of slow controlled

breathing. I put one hand on my chest and the other on my stomach. I try to keep the hand on my chest from moving up and down. Rather, I slowly breathe so that the hand on my stomach moves up and down. Each time I exhale, I focus on the word "relax." Like any exercise I need to practice diaphragmatic breathing for several weeks before I master it. My plan is to practice it for about ten minutes before I go to sleep.

☐ Consider also an exercise plan to further reduce stress, diet plan to increase my energy, and good sleep to support the relaxation and improve my likelihood of doing even better on the test.

☐ Adjust or change any of the plans that are not working and monitor the changes.

☐ Just before a test, I practice diaphragmatic breathing thinking of the word "relax."

Strength is the capacity to break a Hershey bar into four pieces with your bare hands
- and then eat just one of the pieces."
— Judith Viorst

Tell your story: Recall a past Strength challenge

Objective: Completing this exercise will help to link this new learning to prior learning, something you did with some success in the past, so as make Strength more memorable.

Strength grows from proper nutrition, exercise, relaxation and sleep.

Recall a past personal challenge where you successfully used the skill of Strength, perhaps relating to exercise, diet, relaxation, or sleep. Work on answering the following questions. Feel free to work individually or in collaboration with another person on this exercise.

1. What was your challenge?
2. How was your challenge related to diet, exercise, relaxation and/or sleep?
3. If it was a diet, how was it "healthy" and how did it fit your lifestyle.
4. If it was a physical exercise plan, how did it fit your lifestyle yet provide at least 2 hours and 30 minutes of moderate-intensity aerobic physical activity throughout the week.
5. If it was a relaxation exercise, how did it relax you and fit into your lifestyle?
6. If it was good sleep hygiene, then what methods did you use and how did this fit into your lifestyle?

Collaborate: Apply Strength to a current challenge

Objective: Completing this exercise with another person will encourage communication, empathy, and the ability to reach out while problem-solving a relevant challenge.

We strongly encourage you to do this exercise with another person so that you become aware of how to work with people within a social support system, people who will work with you on real life challenges. Consider a challenge either you or perhaps someone you know has currently encountered.

Write the challenge in as much detail as necessary to allow you, and your associate, to answer the following questions. Write your responses.

1. What is your challenge?
2. How does it relate to diet, exercise, relaxation and/or sleep.
3. Find and practice a healthy diet that fits your lifestyle yet lowers your health risks (Reedy, Krebs-Smith, Miller, Liese, Kahle, Park, & Subar, 2014).

- Consider researched diet plans such as MyPlate ("ChooseMyPlate.gov," 2018), Healthy Eating Plate (Willett, 2011), Mediterranean (Mitrou, Kipnis, Thiébaut, Reedy, Subar, Wirfält, … & Schatzkin, 2007), and DASH—Dietary Approaches to Stop Hypertension ("DASH Eating Plan," 2018).

4. Find and practice a physical exercise plan that fits your lifestyle and provides at least 2 hours and 30 minutes of moderate-intensity aerobic physical activity ideally spread evenly throughout the week ("Steps to Wellness," 2012; "Global Recommendations on Physical Activity," 2013).

5. Find and practice a relaxation exercise. Recognize that like any physical exercise, you will need to practice with these relaxation exercises to realize the results.
    - *Diaphragmatic Breathing* or eupnea is a simple relaxation exercise of slow breathing with focus on movement of the diaphragm. Put one hand on your chest and the other on your stomach. Try to keep the hand on your chest from moving up and down. Rather, breathe so that the hand on your stomach moves up and down. As you exhale, focus on the word "relax." (Chen, Huang, Chien, & Cheng, 2017).
    - *Progressive Muscle Relaxation* (PMR) to bring awareness of the body by focusing on slowly tensing and then relaxing each muscle group (Davis, Eshelman, & McKay, 2008).
    - *Social Resilience Model* (SRM) uses stabilization skills to reduce and prevent the symptoms of stress. In its simplest form, SRM focuses on accessing the parasympathetic system through several processes (Leitch & Sutton, 2013).
    - *Mindfulness-Based Stress Reduction* (MBSR) is the practice of bringing awareness to the present moment (Kabat-Zinn, 2005).

6. Practice good sleep hygiene by keeping a consistent sleep–wake schedule, exercising daily and eliminating long naps and naps within a few hours of bedtime (Elliot & Kuehl, 2007).
7. How will you ensure that you have the belief to persist with the challenge?
8. Will you create a goal to build the belief you can meet the challenge?
9. Describe your goal.
10. Is the goal reachable within a realistic time limit?
11. Describe the steps that are needed to reach your goal.
12. Do you have enough steps to mark your progress and build belief you can persist?

If you are working within a classroom environment, consider posting your outcome with other groups' outcomes from the class. Through this learning process, you can observe how social support systems apply positive coping skills to solve real life challenges.

Own it: Reflecting on Strength

Objective: Completing this exercise will make the skills more understandable and therefore more workable for you.

1. You have applied the Strength skill to an instance that had occurred in your past. You have also applied the skill as group problem-based-learning to a current challenge. Now, reflect upon the skill. What is a word, words, or a phrase that best captures the idea of the skill of Strength. This is a good *oral* exercise in a group or classroom setting to determine if everyone is understanding the concept. It can be helpful to have someone facilitate this exercise. The facilitator makes sure everyone has an opportunity to orally describe the skill.

2. Reflect upon the skill of Strength and, in a few of your own words, summarize in *writing* what this positive coping skill means to you. You are attempting to adapt the meaning of the skill to something that is more useable and memorable to you. If you are working in a group or classroom setting, post your responses, and recognize the awesome power of social support.

3. If more time is available, finding a memorable quotation can be a powerful way to personalize and adapt the skill. What would you use as a memorable quotation for the this skill? You are again attempting to adapt the meaning of the skill to something that is more useable and memorable to you. If you are working in a group or classroom environment, post your results with others in the group and observe the results and recognize the power of diversity.

How am I doing?

Objective: Completing this assessment will provide opportunity to monitor progress, adjust your learning, develop self-efficacy, and improve self-esteem.

The following assessment allows you to monitor learning and track your changes as you continue to explore positive-coping skills and social support. You are encouraged to compare these ongoing assessments to see how you have adapted to the learning and resilience.

Learning Objectives				
Assess how well the learning objectives are working for you. Answer by checking only one response to each of the following objectives.	👎👎 **Do not recall doing this**	👎 **Not a useful exercise**	👍 **Useful**	👍👍 **Very useful**
Relate a past challenge to the Strength resilience skill.				
Apply Strength, to a current challenge, with a member of your social support system.				
Redefine, in your own words, the meaning of Strength.				
Recognize the importance of developing personal resilience by using positive-coping skills and social support system.				

Change of Behavior				
Assess how much you have changed. Answer by checking only one response to each of the following.	👎👎 **Worstened**	👎 **No change**	👍 **Improved**	👍👍 **Much improved**
Ability to apply positive coping resilience skills to personal challenges.				
Ability to reach out to a social support system to better deal with personal challenges.				
Ability to problem solve when dealing with personal challenges.				

Change of Behavior				
Assess how much you have changed. Answer by checking only one response to each of the following.	👎👎 **Worstened**	👎 **No change**	👍 **Improved**	👍👍 **Much improved**
Improvement of self-efficacy, the ability to persist in meeting a goal when dealing with a challenge.				
Improvement of self-esteem.				

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TRUST

Trust develops by using empathy to engage, reach out, and give support.

Meaning: I learned trust as a toddler. Without it, I would not have survived. I learned, too, that my peers shape me to interact with the world as we perceive it. We become a community of one, trusting and sharing common values. If our values are honorable, we win. If our values are bad, we lose. As goes my peer group, so I go. Thus, I have learned to choose carefully with whom I want to spend time.

I learn of other people from other people. Empathy is the key that opens the lock into the lives of others. I walk the walk of another. I see through their eyes. Empathy is not sympathy. Empathy lets me understand what another experiences from their frame of reference. I have to suppress my beliefs so that I can interpret those of another. Then trust can develop by reaching out to engage and provide support. A challenging decision, trust. It is after all the substance of faith, a key to my inner self, my identity.

Support comes in many forms. As I face a challenge, I look to my strengths and weaknesses. Where I find need, I find experts to provide insight. Each has a role to play in meeting the challenge. As one, they form a system, a social support system to meet the challenge. Yet, each person is one I can reach out to. They are my social support system.

My support system changes as I change. Some will remain in my social support system, those that are lifelong, perhaps family. There are new challenges. Still, everyone has a role to play in a system however big or small. So, never underestimate the value a toddler's hug when facing a seemingly insurmountable challenge. Only when recognized does consequence have personal meaning.

Identifying and sustaining a healthy support system becomes a continuous and lifelong process. I too may also play any of a variety of roles in other peoples' social support systems. By practicing and sharing positive coping skills I am making those interacting with me more resilient.

My social support system is a measure of my success, survival and legacy. Sustaining others sustains self. Together we share success, learn from failure, and cope with the challenges of life. There is a degree of trust in our relationships. We share a key.

Have you examined your keys? With who would you entrust a key?

Why: Social support is considered one of the best protections from the effects of stress and suicide. Trust is foundational to all relationships, whether personal, professional or organizational.

How: Develop your social support system by identifying the challenge or challenges you may be facing. Consider people who would be helpful dealing with a challenge and the role each would play.

- Consider your challenge and identify your strengths and weaknesses to better identify your needs and the support you bring.
- Consider people who best meet your needs while assuring you are comfortable reaching out to them and they are comfortable reaching out to you.
- Identify those individuals in your support system, roles they play, and how to contact them.
- Identify also the contributions you make to help sustain your support system.

Example: I have an uneasy feeling that one of my friends may be thinking about suicide. I am unsure how to handle this situation and need a plan on how to approach my friend.

☐ The challenge is to help a person who may be considering suicide.

☐ Recognize that I am now part of my friend's social support system and I have a role to play.

☐ Recognize suicide is one of the leading causes of death for teens and young adults.

☐ Identify community resources.

☐ Contact resources to determine the best way to handle the situation.

☐ Be prepared to reach out to the person and listen.

☐ Question the person about the possibility of suicide.

☐ Persuade the person to get help.

☐ Refer the person to the identified resources for specialized help. Offer to get the person to assistance or call 911 if critical.

☐ Do a personal welfare check to best encourage a positive outcome.

Trust is the glue of life.
—Stephen Covey

Tell your story: Recall a past Trust challenge

Objective: Completing this exercise will help to link this new learning to prior learning, something you did with some success in the past, so as make Trust more memorable.

Empathy develops by seeking to understand what another being is experiencing from their point of view. Trust develops by reaching   out to engage and provide mutual support.

We have long recognized that reaching out and seeking assistance is a difficult and complex process. When and where we reach out, the types of problems we are seeking help for, our attitudes, and the attitudes of the person offering the help all have an impact (Gourash, 1978). Most of us have seen children reach out and experience the positive consequences of that action. That ability to reach out and find social support can have an important influence on the ability to be resilient (Williams, Lindsey, Kurtz, & Jarvis, 2001). Trust is foundational to all relationships, whether personal, professional or organizational (Rodwell, McWilliams, & Gulyas, 2017; Serrat, 2017).

Recall a past personal challenge where you successfully used the skill of Trust or something similar to Trust, where you reached out for social support. Work on answering the following questions. Feel free to work individually or in collaboration with another person on this exercise.

1. What was your challenge?
2. With regard to the challenge, what were your perceived strengths and weaknesses?
3. Did you use this understanding of strengths and weaknesses to better identify the individual or individuals in your social support system?
4. With regard to the challenge, what allowed you to reach out to others?
5. What do you think allowed them to reach out to you?
6. With regard to the challenge, did you use empathy as an aid to communication and critical thinking? Remember that empathy is not sympathy, rather it is being able to "see through the eyes" of another person and experience their "point of view."
7. Did you keep the social support system following the challenge?
8. If so, what contributions did you make to sustain the support system over time?

Collaborate: Apply Trust to current needs or a specific challenge

Objective: Completing this exercise with another person will encourage communication, empathy, and the ability to reach out while problem-solving a relevant challenge.

Many of us are still socialized to "suck it up and drive on." But, if we were to perpetuate this attitude in our personal lives it could have potentially serious consequences. The healing value of social support systems is particularly important for people who have survived horrific events (Bloom, 1998; Brewin, Andrews, & Valentine, 2000; Koenen, Stellman, Stellman, & Sommer Jr, 2003). Seligman (2006) noted "people who have at least one person, whom they can call in the middle of the night to tell their troubles to, go on to have better health than friendless people. Even ordinary social contact is a buffer against illness. People who isolate themselves when they are sick tend to get sicker." The lack of a social support system increases the risk of developing PTSD after a traumatic event or events.

Consider your challenges with regard to empathy, reaching out to others, letting others reach out to you, and social support system. Empathy is often described as putting aside one's own beliefs and instead "seeing through the eyes of another" or "walking in the shoes of another." It is important to understand that empathy is not the same as sympathy, rather it is a critical thinking skill to help give you insight. As an example, notice that every *Meaning* segment for every skill was written in the first person, I. By writing these in first person, you were encouraged into trying to see through the "eyes" of that person and ask the question, "Just who is this person?" Maybe you were put off by this person, or maybe you wanted to reach out and get to know more about the person. Regardless, this was an intentional act to help you into thinking about empathy. You have been practicing empathy. And, reading is a good way to practice empathy.

The social support system is arguably our most important sustaining element when coping with adversity. Notice that we refer to a social support system. System, by definition, is a group of interacting elements forming a complex whole. Thus, each person within our social support system serves a specific purpose, perhaps addressing a personal need, and forms a tight and supportive community that we can reach out to.

Begin the process of developing your own social support system. Consider a challenge either you or perhaps someone you know is facing as the motivation for developing a social support system. We strongly encourage you to do this exercise with at least one person so that you become aware of how to work with people within a social support system, those people who will work with you on real life challenges. Write your responses to the following questions.

1. What is your challenge.
2. Consider your challenge and identify your strengths and weaknesses to better identify your needs.
3. Consider people who best meet your needs while assuring you are comfortable reaching out to them and they are comfortable reaching out to you.
4. Identify those individuals in your support system, roles they play, and how to contact them. Some people may have significant roles in your social support system, while others may have more limited roles.

If you are working within a classroom environment, consider posting your outcome with other groups' outcomes from the class. Through this learning process, you can observe how social support systems apply positive coping skills to solve real life challenges.

Own it: Reflecting on Trust

Objective: Completing this exercise will make the skills more understandable and therefore more workable for you.

1. You have applied the Trust skill to an instance that had occurred in your past. You have also applied the skill as group problem-based-learning to a current challenge. Now, reflect upon the skill. What is a word, words, or a phrase that best captures the idea of the skill of Trust. This is a good *oral* exercise in a group or classroom setting to determine if everyone is understanding the concept. It can be helpful to have someone facilitate this exercise. The facilitator makes sure everyone has an opportunity to orally describe the skill.

2. Reflect upon the skill of Trust and, in a few of your own words, summarize in *writing* what this positive coping skill means to you. You are attempting to adapt the meaning of the skill to something that is more useable and memorable to you. If you are working in a group or classroom setting, post your responses, and recognize the awesome power of social support.

3. If more time is available, finding a memorable quotation can be a powerful way to personalize and adapt the skill. What would you use as a memorable quotation for the this skill? You are again attempting to adapt the meaning of the skill to something that is more useable and memorable to you. If you are working in a group or classroom environment, post your results with others in the group and observe the results and recognize the power of diversity.

How am I doing?

Objective: Completing this assessment will provide opportunity to monitor progress, adjust your learning, develop self-efficacy, and improve self-esteem.

The following assessment allows you to monitor learning and track your changes as you continue to explore positive-coping skills and social support. You are encouraged to compare these ongoing assessments to see how you have adapted to the learning and resilience.

Learning Objectives				
Assess how well the learning objectives are working for you. Answer by checking only one response to each of the following objectives.	👎👎 **Do not recall doing this**	👎 **Not a useful exercise**	👍 **Useful**	👍👍 **Very useful**
Relate a past challenge to the Trust resilience skill.				
Apply Trust, to a current challenge, with a member of your social support system.				
Redefine, in your own words, the meaning of Trust.				
Recognize the importance of developing personal resilience by using positive-coping skills and social support system.				

Change of Behavior				
Assess how much you have changed. Answer by checking only one response to each of the following.	👎👎 Worstened	👎 No change	👍 Improved	👍👍 Much improved
Ability to apply positive coping resilience skills to personal challenges.				
Ability to reach out to a social support system to better deal with personal challenges.				
Ability to problem solve when dealing with personal challenges.				
Improvement of self-efficacy, the ability to persist in meeting a goal when dealing with a challenge.				
Improvement of self-esteem.				

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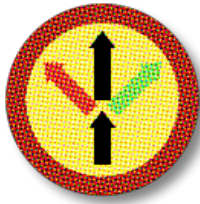
ADAPTABILITY

Adaptability is the flexibility to meet a challenge.

Meaning: Surviving birth is heroic. Though to thrive meant that I needed to adapt. Adaptability became a belief upon which I learned to change. Adaptability is my Swiss Army knife, a MacGiver that comes up with solutions to what seem impossible challenges.

A Swiss Army knife, you ask. Support comes in many ways. It may be a close group of people who sustain me as I sustain them. It may be a mentor that guides me through a challenge. Or, it may be a Swiss Army knife that provides support. Whatever the means, adaptability provides confidence and understanding that I can meet the challenge. There are times when I alter the challenge to make it more positive, workable. I have adapted. When I am unable to change the challenge, I change the way I perceive it. My perception is an expectation of success. My success is a reachable goal, a belief. When my attitude improves and the challenge becomes more manageable, I have adapted.

Challenges, both personal and as a greater community, may be intuitively simple or increasingly complex. If the challenge is complex, I research the challenge to determine if a skillful solution is already developed. Or, perhaps I can adapt the skillful solution to better meet my challenge. I discuss the challenge and a potential skillful solution with others to be sure the idea is understood and can meet its intended purpose. I may find myself blending other skills to create an attainable goal. If what I adapt affects others, I may decide to include a definition about the skill, why the skill meets the challenge, and how the skill meets the challenge. We are after all a community of one.

Adaptability is my Swiss Army knife, a MacGiver that meets my challenges. How have you adapted?

Why: Those believing they have the ability to succeed are more likely to pursue a challenge as something to be mastered rather than as a threat to be avoided. Developing the skill to best adapt to a challenge gives you confidence and control. You are empowered — you own it!

How: Developing your skill can be a goal setting process that calls for planning, cooperation, persistence and control to fully define and develop.
- Consider your challenge and research the idea. Perhaps a skillful solution is already developed.
- Discuss the skill idea with others to be sure the idea is understood and can meet its intended purpose.
- Consider creating the skill as a goal that is reachable along with the steps necessary to reach the goal.
- Steps may include a definition About the skill, Why the skill meets the challenge, and How the skill meets the challenge.

Example: Using the idea of "Who am I going to call when …," I want to extend my social support system to include people who have abilities I may need. I will start with the simplest and move to the most essential members of my social support system. I further want to adapt my phone contact app to include these people in my contact list.
☐ The challenge is to extend my social support system using my phone contact list. (About…)
☐ Preparing for the future shapes me to adapt to the unexpected. (Why…)

☐ Research my phone contact app and begin with the easier contacts moving to more complex. (How…)

☐ Consider how the contact app searches for information such as by using name, roles people play, and quickly identifying the entire Social Support System using a unique identifier SSS.

☐ Consider services such as electricity, water, gas, plumber, and roadside assistance.

☐ Consider healthcare such as physician, dentist, and veterinarian.

☐ Consider emergency services such police, fire, and poison control.

☐ Consider family, associates, and friends and the roles they play in the social support system.

☐ Consider In Case of Emergency (ICE) contact.

Adaptability is not imitation. It means power of resistance and assimilation.
—Mahatma Gandhi

Tell your story: Recall a past Adaptability challenge

Objective: Completing this exercise will help to link this new learning to prior learning, something you did with some success in the past, so as make Adaptability more memorable.

Adaptability is the confidence and understanding to create and pursue a skillful outcome that best meets the challenge.

Maxwell is credited with saying "Change is inevitable. Growth is optional." Changes bring about challenges from the closely personal to perhaps the far ranging challenges relating to social–ecological systems impacting us as a civilization. (Walker, Holling, Carpenter,& Kinzig, 2004). An adaptable person is able to adjust to different conditions. The adaptable person has the confidence and understanding to create and pursue a skillful outcome that best meets the challenge. We are all different and what works for one person may not work for another, so an adaptable person will seek out positive coping mechanisms and solutions that best meet personal needs (Six myths, n.d.).

Provided that definition of Adaptability from the flashcard, recall a past personal challenge where you successfully used the skill of Adaptability or something similar to Adaptability. Work on answering the following questions. Feel free to work individually or in collaboration with another person on this exercise.

1. What was your challenge?
2. Did you in any way do any research to see if a skillful solution had been already developed?
3. Did you discuss the skillful solution with any others to be sure the idea was understood and could meet its intended purpose?
4. Did you develop or consider creating the skill as a goal that is reachable along with the steps necessary to reach the goal?
5. What was your goal and what were the steps that were followed to meet the goal?
6. Did you give the skill a title try to title, include a definition *About* the skill, *Why* the skill would meet the challenge, and *How* the skill would meet the challenge?

Collaborate: Apply Adaptability to a current challenge

Objective: Completing this exercise with another person will encourage communication, empathy, and the ability to reach out while problem-solving a relevant challenge.

We strongly encourage you to do this exercise with another person so that you become aware of how to work with people within a social support system, people who will work with you on real life challenges.

Consider a challenge either you or perhaps someone you know has currently encountered. Write your responses.

1. What is your challenge?
2. Consider your challenge and research the idea. Where might you look for potential solutions?
3. Discuss the skill idea with others to be sure the idea is understood and can meet its intended purpose. The skill idea or "sharing of a vision" may be considered a leadership process, especially if you intend to get help from others. According to Kouzes and Posner (2009), to share your vision you "envision the future" through possibilities and "enlist others in the dream" by appealing to shared goals. These individuals play an important role in providing you with perspective as to whether you appear to be on the right track. As there appears to be a relationship between resilience and leadership (Bartone, Kelly, & Matthews, 2013), who will you work with to best assure you have a skillful solution?
4. Do you want to create the skill as an attainable goal along with the steps necessary to reach the goal?
5. What is the goal and what are the steps?
6. If you intend to share the skill with others, how will you make the skillful solution more understandable? Will you create a definition *About* the skill, *Why* the skill meets the challenge, and *How* the skill meets the challenge?

If you are working within a classroom environment, consider posting your outcome with other groups' outcomes from the class. Through this learning process, you can observe how social support systems apply positive coping skills to solve real life challenges.

Own it: Reflecting on Adaptability

Objective: Completing this exercise will make the skills more understandable and therefore more workable for you.

1. You have applied the Adaptability skill to an instance that had occurred in your past. You have also applied the skill as group problem-based-learning to a current challenge. Now, reflect upon the skill. What is a word, words, or a phrase that best captures the idea of the skill of Adaptability. This is a good *oral* exercise in a group or classroom setting to determine if everyone is understanding the concept. It can be helpful to have someone facilitate this exercise. The facilitator makes sure everyone has an opportunity to orally describe the skill.

2. Reflect upon the skill of Adaptability and, in a few of your own words, summarize in *writing* what this positive coping skill means to you. You are attempting to adapt the meaning of the skill to something that is more useable and memorable to you. If you are working in a group or classroom setting, post your responses, and recognize the awesome power of social support.

3. If more time is available, finding a memorable quotation can be a powerful way to personalize and adapt the skill. What would you use as a memorable quotation for the this skill? You are again attempting to adapt the meaning of the skill to something that is more useable and memorable to you. If you are working in a group or classroom environment, post your results with others in the group and observe the results and recognize the power of diversity.

Be willing to change because life won't stay the same.
— Anonymous

As you complete this exercise, reflect for a moment on the process you have just completed whereby you had the challenge of coming up with a word, words, or a phrase that best captured the idea of Adaptability. You reinterpreted the Adaptability skill into your own words. In doing so, you have adapted the skill. And, you did this for the other positive-coping skills of Belief, Persistence, Strength, and Trust. You have been successfully applying and practicing the Adaptability skill. You made each of the skills your own. You are empowered — you own it!

How am I doing?

Objective: Completing this assessment will provide opportunity to monitor progress, adjust your learning, develop self-efficacy, and improve self-esteem.

The following assessment allows you to monitor learning and track your changes as you continue to explore positive-coping skills and social support. You are encouraged to compare these ongoing assessments to see how you have adapted to the learning and resilience.

Learning Objectives				
Assess how well the learning objectives are working for you. Answer by checking only one response to each of the following objectives.	👎👎 **Do not recall doing this**	👎 **Not a useful exercise**	👍 **Useful**	👍👍 **Very useful**
Relate a past challenge to the Adaptability resilience skill.				
Apply Adaptability, to a current challenge, with a member of your social support system.				
Redefine, in your own words, the meaning of Adaptability.				
Recognize the importance of developing personal resilience by using positive-coping skills and social support system.				

Change of Behavior				
Assess how much you have changed. Answer by checking only one response to each of the following.	👎👎 **Worstened**	👎 **No change**	👍 **Improved**	👍👍 **Much improved**
Ability to apply positive coping resilience skills to personal challenges.				
Ability to reach out to a social support system to better deal with personal challenges.				
Ability to problem solve when dealing with personal challenges.				

Change of Behavior				
Assess how much you have changed. Answer by checking only one response to each of the following.	👎👎 **Worstened**	👎 **No change**	👍 **Improved**	👍👍 **Much improved**
Improvement of self-efficacy, the ability to persist in meeting a goal when dealing with a challenge.				
Improvement of self-esteem.				

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STEM APPROACH TO EXAMINE RESILIENCE AND SOCIAL SUPPORT

Meaning: Few would challenge the idea that technology is changing us. Technology has quickly and dramatically changed the way we work, socialize, and communicate. Can we also look to technology to enable us to better adapt to these rapid changes?

While we may agree technology is changing us, there is debate as to whether technology is unifying us or alienating us from one another. This is important because how we cope with stress related issues depends upon our personal resilience and social support system. Let us first define resilience as the development and use of skills needed to manage stress in an optimal way (Resilient, 2018). Let us further consider the view of the World Health Organization (WHO). WHO looks at resilience by recognizing the role of protective factors relative to suicide risk factors at both the personal and community level. A key protective factor is the social support system. A healthy support system is where we both give and receive support. Another factor, according to WHO, is spirituality when it provides a socially united and supportive community with a shared set of values. And, finally, having lifestyle practices of positive coping strategies, good self-esteem, self-efficacy and effective problem solving-skills. This includes the ability to reach out and find help when needed (Suicide, 2014).

The social support system is considered an essential protective factor when coping with challenges and adversity. System, by definition, is a group of interacting elements that form a complex whole. If we apply the definition of system to social support, then each person within our social support system serves a specific purpose, perhaps a personal need. As a complex whole, the social support system forms a tight and supportive community that we can reach out to. Reaching out is two-way action. There is an expectation that we will sustain those in our social support system as they sustain us. One way that we can sustain our social support system is practicing and sharing positive coping strategies. We consider these positive-coping skills because our intent is to take personal challenges and create a more positive and less stressful outcomes. We title these skills Belief, Persistence, Strength, Trust, and Adaptability for our learning. What is Belief when we are talking resilience. The way we perceive things is shaped by our beliefs. Beliefs control our actions and our attitude. Attitude is the way we feel about something. We may need to persist to bring about a more positive belief. That is our next skill, Persistence, facing a challenge with the belief we will ultimately succeed. Followed by Strength, the physical aspect of our mental armor contributing to good self-care that includes diet, exercise, relaxation and sleep. Then, Trust the skill of reaching out and developing and sustaining a social support system. And, lastly Adaptability, that we don't forget it's not the strongest nor fastest, but most adaptable that ultimately survives. These skills serve as a personal protective factor and help us to sustain our social support systems. With practice, we become more effective and successful problem solvers thus improving our self-efficacy and self-esteem. Self-efficacy is a belief in one's ability to complete tasks and reach a goal. Whereas, self-esteem is a favorable impression of oneself and may be a consequence of self-efficacy. We now have a shared idea of what it means to be resilient and the importance of a social support system.

Thus, the challenge and the goal of this exercise is to *determine if current technology can serve as a means to better understand resilience and the social support system*.

About: A substantial body of evidence-based research supports both resilience and effective learning. The resilience skills presented here are representative of this research as are the methods for learning these skills. We refer to these resilience skills as positive-coping skills because our intent is to take a personal challenge and create a more positive and less stressful outcome. In addition to donning mental armor to better protect us from stressful challenges, there is the added benefit that we are preparing ourselves for educational success. These skills and the associated learning methods will contribute to academic success (Galatzer-Levy, Burton, & Bonanno, 2012; Hartley, 2011; Martin & Marsh, 2006; Martin & Marsh, 2008).

STEM focuses heavily on the subjects of Science, Technology, Engineering, and Mathematics. The STEM learning is intended to increase interest and literacy in the areas of science and technology and encourage higher education and associated careers. Falling well within a STEM technology curriculum, this exercise introduces the concepts of resilience and social support without adding appreciable time to existing STEM initiatives. The further benefit of transfer-of-learning of subject material outside of the traditional STEM curricula allows us to better understand that learning from one discipline can be applied to another discipline. Our intent, then, is to blend the STEM discipline with the discipline of resilience and social support.

How: Our social support system is expected to have the distinct purpose of helping us cope with challenges and adversity. Often, a family member or members, close friend and associate will be a part of our social support system. There are a myriad of methods that connect us. Yet, wouldn't it be nice to have the opportunity to simply share the thought that "I am thinking about you" with those in our social support system? Therein is the intent of this technology, to share this unimposing idea of "thinking about you" without any expectation of a complicated reply. Could we do this as a text message to the mobile phones of everyone in the social support system? Yes, certainly. But, recall that our goal is to take an educational approach to exploring technologies. We expect to learn something about ourselves and technology from this exercise. Finding communication parallels we display as humans and those of technology could give us with greater insight into how we communicate within our social support system. An outcome might be a better understanding of empathy, a survival skill, that allows us critical insight into another's world.

Empathy is often described as putting aside one's own beliefs and instead "seeing through the eyes of another" or "walking in the shoes of another." It is important to understand that empathy is not the same as sympathy, rather it is a critical thinking skill to help give us insight. This creates a bridge to understanding and communication. Therefore our focus in this exercise is more on the process of personal change than on the development of a technology device. Our technology will be relatively simple and minimal. Indeed, our desire is to provide simple and unimposing communication between people in our social support system.

In this exercise, you collaborate with other people. Who you want to work with is up to you, but consider someone with whom you are comfortable communicating such as a family member, friend, or associate. We will also be working on another type of communication, an entirely machine-based method of communication called MQTT.

MQTT is a simple messaging transport protocol for communicating between devices using a wireless network or the Internet (MQTT, n.d.). MQTT does not require extensive programming nor resources, making it ideal for data exchanges in Machine-to-Machine (M2M) and Internet-of-Things (IOT) where devices need to exchange data with each other. These devices, called clients, communicate by joining, or subscribing, to a central communication point, called a broker, that dispatches messages between the clients. The client that sends, or publishes, a message to the broker, does so with an identifying name,

called a topic, along with the message. Each client wishing to receive the message needs to be subscribed to that topic. The topic becomes the common identifier allowing each subscribed client to continue to receive messages sent by the broker. If we look to parallels with our social support system, we might consider each client to be a personal member of a social support system. So, let us assume that MQTT will serve as a workable communication protocol, a technology method we will use for exchanging information within our social support system.

How might this work? Let's say that Tom sends the message "Hello World" using the topic name "GroupAlpha" to an MQTT broker. Because Dick and Harriet are also subscribed to the topic "GroupAlpha" they will receive the message. But, Emma happens to be subscribed to the topic "GroupBeta" and will therefore not receive any message unless it originates from the topic "GroupBeta."
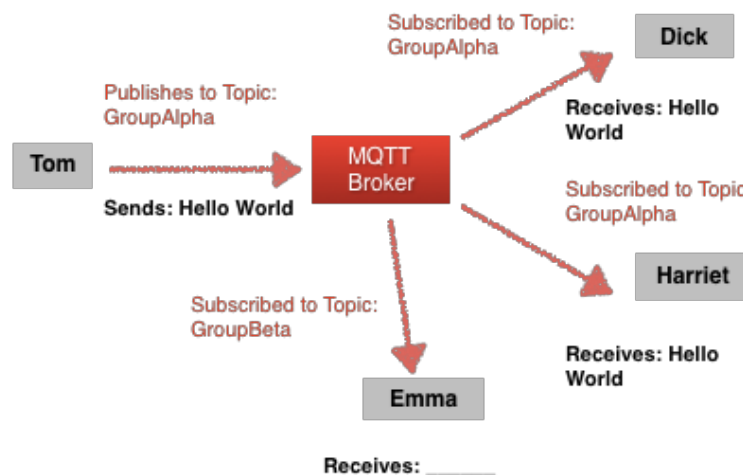
We next need to identify a tool that will use MQTT to allow the social support system to share the simple message of "thinking about you." This development tool needs to be able to connect devices and online services in support of Internet of Things (IoT) without the need of extensive programming. One such tool is Node-RED. Node-RED works in conjunction with our Web browser to form a work area, called a canvas, for developing our activity, or program (Node-RED, n.d.). Node-RED contains a menu, called a palette, of icon-like objects, called nodes, that we can drag and drop on to our canvas and connect together. Each node provides a different function or operation. For example, a button node could be used to start an acton on a connected MQTT node that is used to publish a message to a broker. While a node brings a lot of functionality without any complex programming, a node may still require adjustments making it usable for our specific needs. For example, the MQTT publish node will need to be told the name of the MQTT broker and the topic we want to use for our social support system.

A problem that can be broken down into a series of steps can probably be developed into a visual representation using Node-RED without the need for complex programming. Our program will, however, require that we assemble several nodes, adjust them, and connect them. Cumulatively, these nodes will permit us to send and receive a simple "thinking about you" message with people in our social support system.

Finally, we need to consider the physical technology device that can use MQTT for communication. As our focus is on the learning process, we will look to a minimal technology that provides a simple pathway for using MQTT. The ESP8266 and ESP32 are very common "minimalist" devices, that is, small, low

power, low cost, and have the technology resources to meet our needs. These devices act as both as micro controller and permit MQTT communication. But, these devices would require considerably more technology support, such as soldering, and complex programming that is better saved for a later more advanced exercise. An internet search will, however, reveal that there are nicely developed "thinking about you" systems using the ESP8266 that are well worth reviewing (Michel, 2015).

Our alternative is to consider a simple, low cost computer-based system that will permit rapid development of MQTT communication without the need of more complex programming. The Raspberry Pi 3 provides us with sufficient resources to fully develop our technology without additional support and is heavily supported as an educational tool (Raspberry, n.d.). Raspberry Pi 3 is a minimalist $35 (USD) single-board computer that we supplement with a keyboard, mouse, 5 volt power supply, and an HDMI compatible monitor or TV. The Raspberry Pi, like most computers, requires an operating system (OS) that supports applications such as a Web browser. The most common Raspberry Pi operating system, Raspbian, a Debian Linux derivative, can be freely downloaded or purchased already installed on a microSD card for about $10 and plugged into the Raspberry Pi. One of the many niceties of the Raspbian environment is a graphical user interface complete with all of the application tools, including Node-RED, to develop and apply our MQTT system. Alternatively, if you do not have a Raspberry Pi, Node-RED can be installed on Windows, Macintosh, and Linux computers. The Raspberry Pi Foundation has also made available a downloadable Raspberry PI desktop, with educational software, for Windows and Macintosh computers.

As we work with the technology, we also want to be aware of the positive coping skills that make us resilient. Each of us may find that one or more skills are used for each exercise. You want to keep track of your skill use. Want a method to help remember your skills and keep yourself motivated in the learning process? Consider using a length of paracord, or something similar, and as you find yourself using a skill, tie a knot in the cord. As you complete the exercise, you are asked which of the skills you used and this may help you to remember. Remember that our social support system is one of our most important protective factors in our mental armor. So, when you share the skills with someone in your social support system, you tie the two ends of the cord together and you have begun the process of sustaining your social support system.

1 - RASPBERRY PI SETUP

Meaning: The social support system is our most important sustaining element when coping with challenges and adversity. System, by definition, is a group of interacting elements forming a complex whole. Applying the idea of system to social support, each person within our social support system serves a specific purpose, perhaps addressing a personal need, and forms a tight and supportive community that we can reach out to. We can consider the Raspberry Pi as a system of interacting elements requiring the Raspberry Pi board, NOOBS (New Out Of Box Software), a keyboard and mouse, monitor, and power supply. Like our social support system, each element in the system serves a specific purpose and forms a complex whole.

Objectives: Recall the challenge and the goal of this exercise is to *determine if current technology can serve as a means to better understand resilience and the social support system*. There are a number of objectives, or steps, that help us achieve that goal to include:
• Define the concept of a system.
• Understand the concept of the roles that different elements play within a system by comparing a Raspberry Pi system to that of a social support system.
• Apply though technology the skills of Belief, Persistence, Strength, Trust, and Adaptability.

Raspberry Pi setup: There are web sites and YouTube tutorials that provide detailed step-by-step builds for getting the Raspberry Pi fully operational (Getting started, n.d.). We will therefore simply provide an overview to the process as a general guideline. Completing these steps helps to explain the goal and objectives.

1. Collect the system hardware, to include a Raspberry Pi 3, USB keyboard, USB mouse, 5 Volt 2.5 Ampere Raspberry Pi power supply, HDMI monitor or TV with HDMI cable, and minimally an 8 GB micro SD card (be sure the micro SD comes with the SD card adapter).
2. A micro SD can be purchased with NOOBS already installed. NOOBS contains the Raspbian OS (Operating System) and other useful third party application software. Or, if you have a microcomputer with access to the internet, you can prepare a micro SD yourself. Preparing the micro SD for Raspberry Pi is a three step process of downloading NOOBS, formatting the micro SD, and copying NOOBS to the micro SD.
3. Download NOOBS, a free download from the Raspberry Pi foundation (NOOBS, n.d.). This is a fairly large file and may take awhile to download.
4. Prepare the micro SD by formatting using a free application, such as SD Formatter for Mac or Windows. Plug your micro SD in its adapter card into your computer card slot and follow the instructions on SD Formatter. Depending upon the memory storage amount on your card, the formatting will take several minutes.
5. Copy the NOOBS files by first unzipping the downloaded folder and then copying the contents of the folder onto the SD card. Be sure you only copy the contents of the NOOBS folder, all of the files, rather than the folder itself.
6. Place the micro SD card into the SD slot of the Raspberry Pi 3.
7. Attach the other parts of the system, to include keyboard, mouse, monitor, and lastly the power supply. Once the power supply is connected, the Raspberry Pi will start up.
8. The installation is rather straightforward and you will need to identify WiFi, your time zone, and location.
9. From the first time startup menu, identify your WiFi connection.
10. From the mid menu, select Raspbian.
11. From the bottom of the menu, select the appropriate Language, e.g. English (US), and click the Install button at the top of the menu.
12. Once the system is installed and the Pixel graphical interface appears, you can set your Country, Language, Timezone, Keyboard type, and change the default password and WIFI network.
13. The newer versions of the installation program will also automatically check for any updates. This updating process can be time intensive depending upon internet connectivity.
14. You have completed the installation and setup of the Raspberry Pi 3 and we are now ready to move forward with using Node-RED. Recognize that NOOBS has added a lot of software to include a full office suite as well as the Node-RED application.

Evaluation. Consider again the challenge and the goal of this exercise is to *determine if current technology can serve as a means to better understand resilience and the social support system*. Answer the following questions.

- Do you have a better understanding of how a system works? Define the concept of a system in your own words.
- Now that you have assembled the pieces necessary to make the Raspberry Pi into a working system, describe how that technology *did or did not* help you to better understand a social support system.
- Did you use Belief, Persistence, Strength, Trust, or Adaptability to complete any part of this exercise?

2 - USING NODE-RED, HELLO WORLD

Meaning: If we again look to parallels with our social support system and the Node-RED application, we see that each node, in Node-RED, is tasked with a specific purpose as are the people in our social support system. As a node may need to be adjusted for operation and for communicating with other nodes so must the people in our social support system be made aware of their roles and assisted with communicating with us and other people in the support system. Whether our social support system or the technology, the act of communication and roles requires our dedication and consideration.

The challenges we encounter change us. A new challenge may further encourage us to alter our social support system to best meet need of that challenge. Change is inevitable. Adapting to deal with change is, however, a choice.

Consider now the challenge of using Node-RED. Using Node-RED is a two step process. We first start Node-RED server and then use a browser, like Chromium, to access Node-RED. We can then develop a computer program using Node-RED. Our first program is the traditional approach to learning almost any programming language. We communicate our presence with a simple program that will declare "Hello World." Creating this simple program acquaints us with the environment, Node-RED programming, and also assures the technology is working.

Objectives: Recall the challenge and the goal of this exercise is to *determine if current technology can serve as a means to better understand resilience and the social support system*. There are a number of objectives, or steps, that help us achieve that goal to include:
- Recognize that you need to adapt your thinking, your beliefs, and persist in order to get a computer application to work.
- Identify parallels in the Node-RED setup to working with individuals within a social support system.
- Apply though technology the skills of Belief, Persistence, Strength, Trust, and Adaptability.

1. From the Raspberry Pi pull-down menu, select *Programming*, and *Node-RED*. The *Node-RED console* immediately appears in the Raspberry Pi Terminal and describes the startup process of the Node-RED server. An example of a portion of the dialog follows.

    Node-RED console
    Start Node-RED

    Once Node-RED has started, point a browser at http://192.168.0.19:1880
    On Pi Node-RED works better with the Firefox or Chrome browser

2. Notice that the example dialog tells you to point your browser to *http://localhost:1880,* where localhost will be described as an address unique to your setting. Copy and paste the complete address into your browser to see the Node-RED development area. For example, we see, *Once Node-RED has started, point a browser at http://192.168.0.19:1880.* Thus, in this example, we would start our browser, for example, Chromium, and either type in, or copy and paste the localhost link *http://192.168.0.18:1880* into the browser. Chromium browser is currently bundled with the Raspberry Pi and will work with Node-RED, but other browsers will also work.

3. On the browser Node-RED shows itself as a three column development area. The left column displays the available nodes. The large center area, e.g. Flow 1, becomes a canvas where the desired nodes may be dragged from the left column, or palette, to develop a flow-based program, or flow. The right side can serve as an info and debug area where development status and testing can be monitored. The right side info and debug area can be toggled to appear, or not appear, by pressing the CTRL and Space Bar.

It is customary to develop a "Hello World" program in a new programing environment by injecting the text "Hello World" and displaying it in some manner.

4. To do so, drag the *inject* node from the left column into the center canvas development area, identified as *Flow 1*, by moving the cursor over the *inject* node, left-clicking the mouse button and holding it depressed while dragging the node to the canvas. When the node is in the canvas, release the mouse button. Notice that the *inject* label on the node has been changed to *timestamp*. To the right of the screen, the *Info* menu describes the properties of the node.

5. In a similar manner, drag the *debug* node, from the *output* suite of nodes, onto the canvas. Notice that the *debug* label has been changed to *msg payload* allowing it to display the contents, or payload, of the message.

6. "Wire" the two nodes together by clicking the mouse on the small ball icon appearing on the right side, or output, of the *timestamp* node and dragging a line to the small ball icon appearing on the left side, or input, to the *msg payload* node. Thus, the two nodes are now connected.

7. The final step is to test, or *Deploy,* the program. Click on the *Deploy* button at the top right of the editing canvas. If the construction of the program is successful then a message *Successfully deployed* will so indicate.

8. Run the flow by clicking on the tab extending from the left side on the *timestamp* node. The message *Successfully injected: timestamp* appears. And, selecting the *debug* tab on the right side of the canvas displays a date and time stamp along with a msg payload number.

But, recall that we want to display a message, the text string "Hello World," rather than a timestamp. So, we will adapt or edit the inject/timestamp node to do so.

9. Double-click the mouse on the *timestamp* and the *Edit inject node* menu appears.

10. In the *Payload* entry field, click on the small *down arrow* and select *string*. Type *Hello World* in the entry area of the *Payload*. Then, click the *Done* button and notice the *inject* node is now relabeled as the *Hello World* node.

11. Editing has occurred, so click on the *Deploy* button to test the newly edited flow.
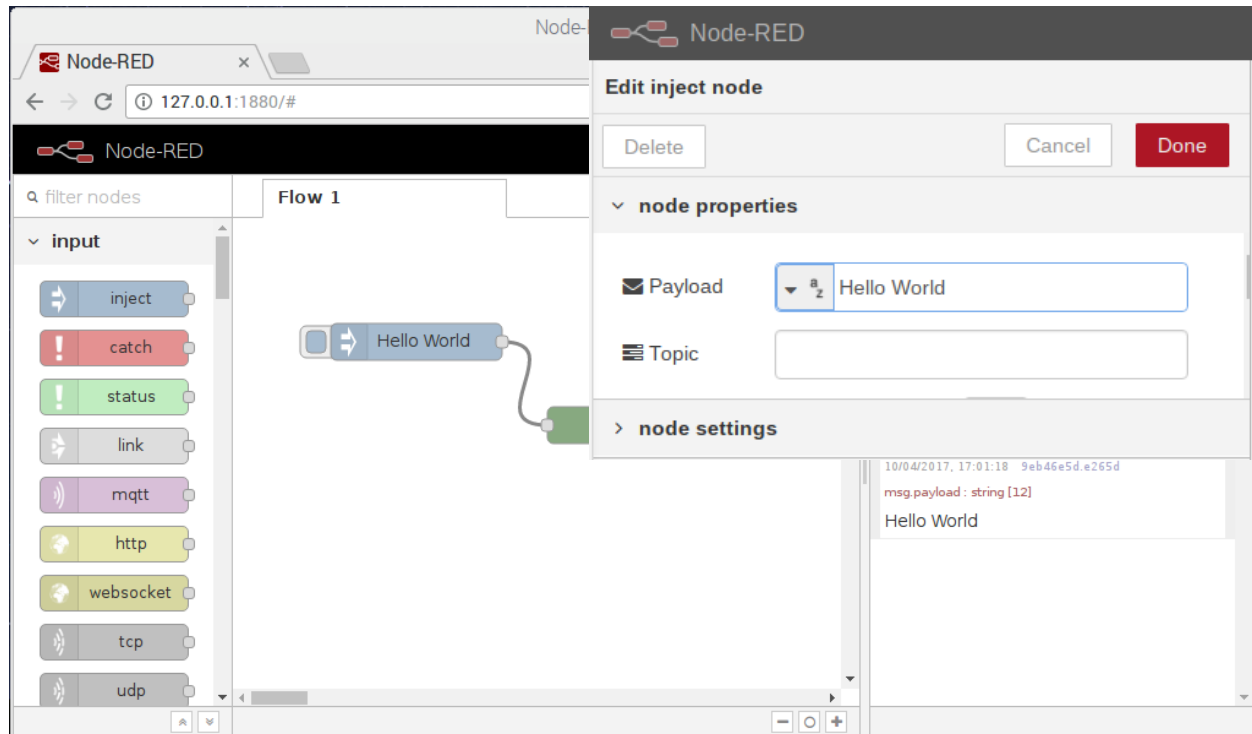
12. Run the flow by clicking on the tab on the left side on the *Hello World* node. Selecting the tab labeled *debug* tab on the right side of the canvas shows the message *Hello World* in the *debug.* Every time the tab on the left side of the *Hello World* node is clicked the message will appear. You have persisted and successfully created a Node-RED program!

Finally, Node-RED saves your program, but if you want to save your program elsewhere or perhaps use it on another computer, the Export function of Node-RED can be used. To do so, hold the *shift* key down and click on one of the nodes in the program. Notice that both nodes are highlighted and selected. Click on the three horizontal bar icon beside the Deploy button. Select *Export* and *Clipboard* from the drop down menu. From the *Export nodes to clipboard* menu, click on the *Export to clipboard* button at the bottom of the menu. You can now paste the content into an editor, such as Text Editor in the Raspberry Pi Accessories menu, and save the results.

Evaluation. Consider again the challenge and the goal of this exercise is to *determine if current technology can serve as a means to better understand resilience and the social support system*.

- How did this particular technology exercise help you to begin to understand and adapt to change brought about by technology? More specifically, do you better understand the concept of programming?
- How did the technology enable you to better understand and use resilience and a social support system? More specifically, now that you have created a program made of nodes that each have a specific role to play, do you find parallels to roles individuals play within a social support system?
- Did you use Belief, Persistence, Strength, Trust, or Adaptability to complete any part of this exercise?

3 - MQTT NODE-RED APPLICATION

Meaning: We identified the technology for our simple communications tool for our social support system. Node-RED serves as our development tool, Raspberry Pi 3 as a device, and MQTT as the communication protocol for our social support system. In the prior exercise we displayed a Hello World message. We want to build upon the prior Hello World exercise and develop a working application that sends a simple message to participants in our social support system using a remote MQTT broker.

Objectives: Recall the challenge and the goal of this exercise is to *determine if current technology can serve as a means to better understand resilience and the social support system*. There are a number of objectives, or steps, that help us achieve that goal to include:

- Compare the roles of system, programming, and communication to the roles played by individuals within a social support system.
- Compare the effort required to get elements within a computer program to effectively communicate and provide results to the effort required to sustain a social support system.
- Apply though technology the skills of Belief, Persistence, Strength, Trust, and Adaptability.

Publishing to a Topic: MQTT is the communication protocol, or language, for communication between participants in our social support system. MQTT uses a publish and subscribe approach to communications. We, as clients, need to subscribe to some topic in order to receive information regarding that topic. And, clients need to publish to that same topic in order to transmit and share information. In this exercise, the information is the message "Hello from Tom" But, where you substitute your name for the "Tom."
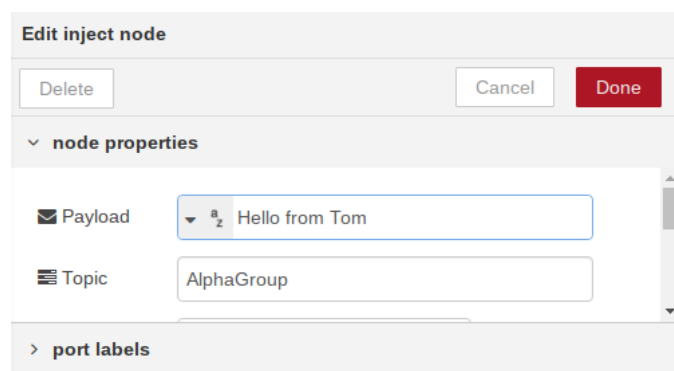
The topic is the common thread that unites our group, That topic can be the name of your support system, for example, "AlphaGroup."

Finally, to distribute our communications to all of the participants, we need a common server, called an MQTT broker, allowing the participants, called clients, to share information wherever internet connectivity exists. There are a number of "free" MQTT brokers that we can use for testing our support system communications. In this exercise we can use the broker identified as mqqt.eclipse.org:1883 but feel free to use a broker of your own choice.
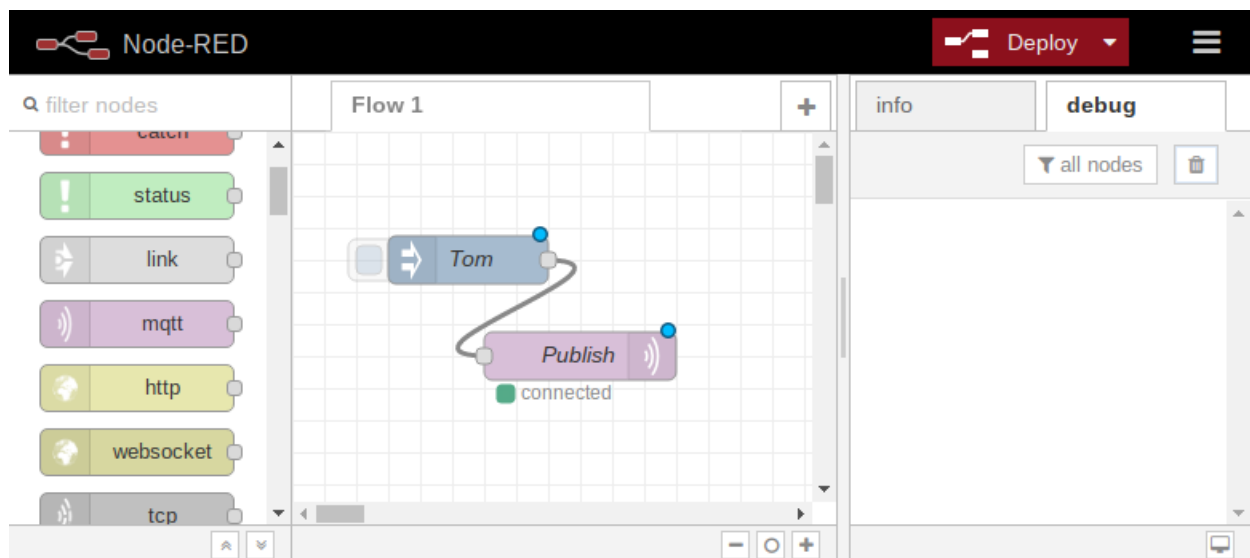
1. From the Raspberry Pi pull-down menu, select Programming, and Node-RED. Once Node-RED has started, the Console will tell you to point your browser at *http://localhost:1880*, where *localhost* will be described as an address unique to your setting. Copy and paste the complete address into your browser to see the Node-RED development area.
2. Drag the *inject* node into the center canvas development area. Notice that the *inject* label on the node has been changed to *timestamp*. To the right of the screen, the *Info* menu describes the properties of the node. Note that if you have developed a Hello World program in *Flow 1*, you may want to develop this new program in *Flow 2* by clicking on the *+* tab appearing beside the *Flow 1* tab.
3. Drag the *mqtt* node, from the *output* suite of nodes, into the center canvas development area. We are intending to output, or send, a message to the MQTT broker.
4. "Wire" the two nodes together by "clicking" the mouse on the small ball icon appearing on the right side, or output, of the *timestamp* node and dragging a line to the small ball icon appearing on the left side, or input, to the *mqtt* node. Thus, the two nodes are now connected.
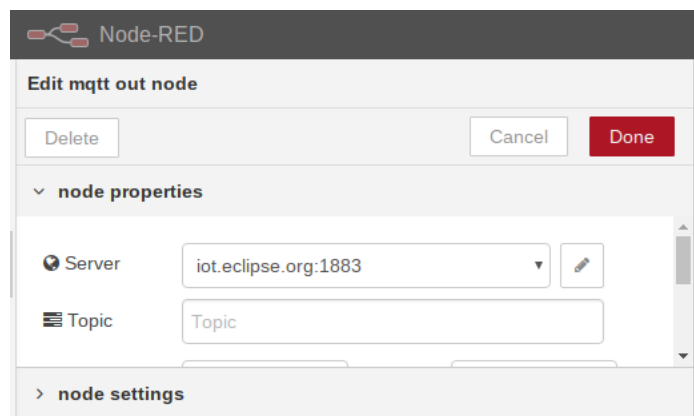
Recall that our challenge is to send a message, for example, "Hello from Tom," rather than a timestamp. Remember to substitute your name in place of "Tom," so that people know your real name. We begin by editing the inject/timestamp node.

5. Double-click the mouse on the *timestamp* and the *Edit inject node* menu appears.
6. In the *Payload* entry field, click on the small *down arrow* and select *string*. Type *Hello from Tom* in the entry area of the *Payload* substituting your name for *Tom*.
7. In the *Topic* entry field, type *AlphaGroup*.
8. In the *Name* entry field, by type your name. Then, click the *Done* button and notice the *inject* node is now relabeled with your name.
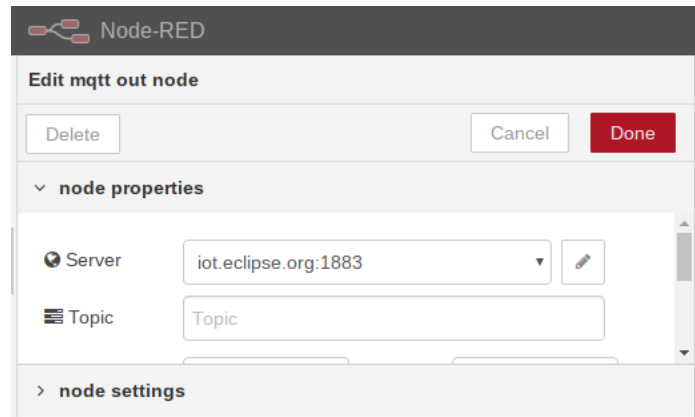
We next need to tell the MQTT node where to send the message, that is we need to tell the node to send the message to a MQTT broker. So, we begin by editing the MQTT node.

9. Double-click on the *mqtt* and an *Edit mqtt out node* menu appears.
10. Click on the *pen* icon appearing by *Server* field to display the *Add new mqtt-broker config node* menu.
11. In the *Server* field, type *mqqt.eclipse.org* to identify the MQTT broker and select *Add*. Note that port 1883 should be automatically added to the address.
12. In the *Name* field of the *Edit mqtt out node* menu, type *Publish* to rename the *mqtt* node for clarity. Then, click the *Done* button and notice the node is now relabeled *Publish*.
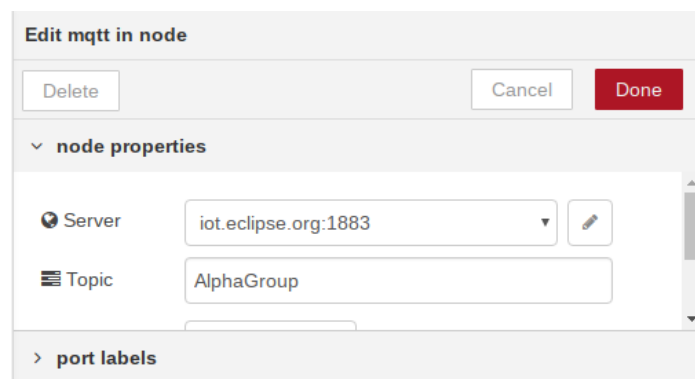
13. Click on the *Deploy* button at the top right of the editing canvas. If the construction was successful then a message will so indicate. A *connected* appearing below the *Publish* node indicates a successful connection with the remote broker.

Subscribing to a Topic. Thus far, we have created the flow to publish a message through an MQTT broker. Subscribing to a topic allows us the receive a message. We can receive, or input, the message we publish by subscribing to the broker. So, we add another MQTT node to represent the broker and the debug node to display the message in the debug area of the menu,

14. Drag the *mqtt* node, from the *input* suite of nodes, to the center canvas in the development area.
15. Double-click on the *mqtt* and an *Edit mqtt in node* menu appears.
16. In the *Server* field, type mqqt.*eclipse.org:1883* to identify the MQTT broker.
17. In the *Topic* field, type in *AlphaGroup* to subscribe to AlphaGroup.
18. In the *Name* field, type *Subscribe* to rename the mqtt node for clarity. Then, click the *Done* button and notice the button is now relabeled *Subscribe*. If we were to now click on the *Deploy* button, we would see *connected* below the *Subscribe* node indicating a successful connection with the remote broker.
19. Drag the *debug* node, from the *output* suite of nodes, onto the canvas. Notice that the debug label has been changed to *msg payload* allowing it to display the payload of the message.
20. "Wire" the two nodes together by "clicking" the mouse on the small ball icon appearing on the right side, or output, of the *Subscribe* node and dragging a line to the small ball icon appearing on the left side, or input, to the *msg pay load* node. Thus, the two nodes are now connected.
21. Click on the *Deploy* button at the top right of the editing canvas. If the construction was successful then a message will so indicate.
22. Finally, run the flow by clicking on the tab on the left side of the *Tom* node, where of course, you will have substituted your name for Tom. Selecting the tab labeled *debug* tab on the right side of the canvas shows the message *Hello from Tom*. Every time the tab on the left side on the *Tom* node is clicked the message is being sent to the remote broker through the Internet and back again to you. You have successfully created a program to see how the Internet of Things (IoT) communicates using MQTT.
23. Did you do this exercise with others programming their Respberry Pi computers to work with IoT? Are you seeing any other messages? What does it mean?
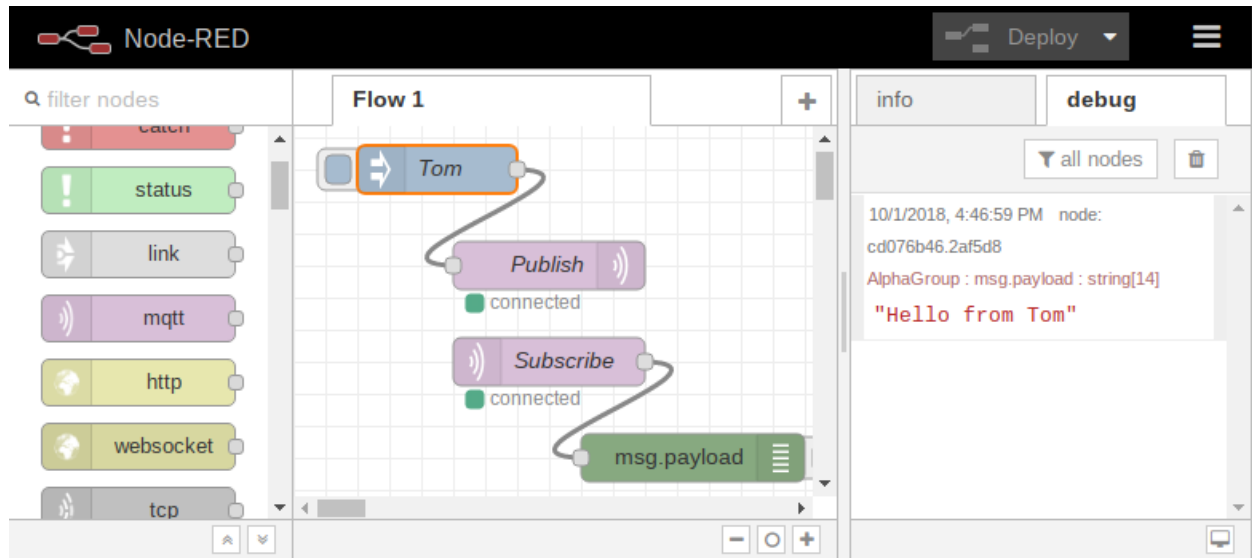
Evaluation. We return to the questions posed at the beginning of this exercise, as well as any questions you decided to explore, to determine its personal effectiveness. Consider again the challenge and the goal of this exercise is to *determine if current technology can serve as a means to better understand resilience and the social support system*.

- How did this particular technology application enable you to begin to understand and adapt to change brought about by technology? More specifically, do you have a better understanding of such concepts as a system, programming, and communication?
- How did the technology enable you to better understand and use resilience and a social support system? Specifically, now that you have created a program made of nodes that each have a specific role to play and got them to work together, do you see parallels to the roles individuals play within a social support system?
- Did you use Belief, Persistence, Strength, Trust, or Adaptability to complete any part of this exercise?

Remember that having good self-esteem, self-efficacy, effective problem solving-skills, and lifestyle practices of positive coping strategies are important to one's sense of resilience. Did you find you experienced personal change, such as a change in your Belief about being able to program a computer? Consider sharing this change with the people in your support system and perhaps us for our learning.

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On staying resilient

Objective: Completing this evaluation provides a summary of overall learning and personal change.

A look back to what you have accomplished is a way to determine the personal impact of all the learning, that is, you are looking at it summatively to determine its effectiveness upon you. Complete this measurement several weeks after you have completed the learning to get a sense of continuity, where you have been and what to do next. Identify any of your areas of weakness and review and practice those materials with your social support system. Should you want additional background information, consider the companion text, *A Community of One: Building Social Resilience.*

Reaction to Learning Materials and Delivery of the Learning Experience				
Assess *your* perception of the learning materials and delivery of the learning. Check only one response to each of the following.	👎👎 **Very poor**	👎 **Poor**	👍 **Okay**	👍👍 **Very good**
Effectiveness of learning materials and resources.				
Effectiveness of delivery of the learning experience.				

Learning Goals and Objectives Assessment				
Assess the quality of *your* interaction with each of the program objectives. Check only one response to each of the following objectives.	👎👎 **Don't recall doing this**	👎 **Not useful**	👍 **Useful**	👍👍 **Used this again**
Apply Belief to a current challenge in conjunction with a member of your social support system.				

Learning Goals and Objectives Assessment				
Assess the quality of *your* interaction with each of the program objectives. Check only one response to each of the following objectives.	👎👎 **Don't recall doing this**	👎 **Not useful**	👍 **Useful**	👍👍 **Used this again**
Apply Persistence to a current challenge in conjunction with a member of your social support system.				
Apply Strength to a current challenge in conjunction with a member of your social support system.				
Apply Trust to a current challenge in conjunction with a member of your social support system.				
Apply Adaptability to a current challenge in conjunction with a member of your social support system.				

Change of Behavior				
Assess *your* perception of changes in *your* behavior. Check only one response to each of the following.	👎👎 **Worstened**	👎 **No change**	👍 **Improved**	👍👍 **Much improved**
Ability to apply positive coping resilience skills to personal challenges.				
Ability to reach out to a social support system to better deal with personal challenges.				
Ability to problem solve when dealing with personal challenges.				
Improvement of self-efficacy, defined as the ability to persist in meeting a goal when dealing with personal challenges.				
Improvement of self-esteem.				

Learning to apply these positive-coping skills and developing a social support system might be compared to when you first learned to tie a shoe or perhaps learned to ride a bike. You learned the process, but it was continued practice that made that learning a fluid action requiring little effort. That same mindset needs to be applied to this current learning simply because this in a lifelong endeavor. Keep the mental armor shiny and intact and it will protect you and those closest to you.