

Guiding points:

1. Definition
2. Why is it important?/Impact on Life Outcomes
3. How to build these skills/Interventions/Method
4. Assessment/How to measure these skills/Available instruments

Critical thinking

1. Definition :

‘ Critical thinking’ is generally used to describe a range of thinking skills like identifying assumptions, analyzing arguments, answering and asking questions of clarification or challenge, judging the credibility of a source, etc. Critical thinking in this broad sense includes abilities to- 1. Differentiate opinions from evidence 2. Support one’s opinions with evidence 3. Propose opinions alternatives to one’s own, and think about what evidence that can support these, etc. (Anderson and Sonder,2001)

The common definition that is generally agreed upon of critical thinking is “purposeful, self regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well the explanation of the evidential, conceptual, methodological, criteriological, and contextual considerations upon which the judgment is based” (Facione, 1990). According to Facione the ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit.

Critical thinking skills combine multiple purposes including cognitive, attitudinal and behavioural dispositions. Dispositions are characteristics that reflect one’s inclination and consistent internal motivation to apply the acquired skills. These habits of mind qualities include- open mindedness, inquisitiveness, flexibility, persistence, propensity to seek reason, and willingness to entertain diverse viewpoints (Hoskins and Liu, 2019)

According to Halpern(2003), Critical thinking is, “ the use of those cognitive skills and strategies that increase the probability of a desired outcome. It is used to describe thinking that is purposeful, reasoned and goal directed-the kind of thinking involved in solving problems, formulating inferences, calculating likelihood and

making decisions, when the thinkers are using skills that are thoughtful and effective for the particular type and context of a thinking task.” (Butler H.A, 2012)

2. Relationship between skills of critical thinking and life outcomes

According to Facione and colleagues, critical thinking includes inductive and deductive reasoning, as well as making correct analyses, inferences, and evaluation. These competencies are important for deeply understanding the academic content, and they also relate to later career performance. Research suggests that for a company to constantly grow and improve, it requires its employees to continuously improve processes, products, and or services. The heart of this continuous improvement is knowing the right questions to ask (Soland,J., Hamilton, L.S., Stetcher, B.M, 2013).

A range of studies have drawn positive correlations between students’ score on critical thinking assessments and their GPAs/academic test scores. (Insight Assessment, 2020), (Miller, Sadler, and Mohl,1993), (Nur’azizah, 2021)

Critical thinking is also considered a crucial component in building future citizens as the present times demand the citizens to engage and participate in a plural and democratic society that enables them to find their position in it and contribute meaningfully. Critical thinking is often referred to as the ability to understand the existing injustice in the world and work towards overcoming the same. Critical thinking enables the learner to question the norms and structures of society and imagine alternative ways of doing things(ten Dam,& Volman,2004). Researchers like Peredo and Mc.Lean argued that citizens with high critical thinking are more likely to give back to the society through social entrepreneurship aimed at benefiting others.

3. Developing critical thinking skills in schools

Critical thinking by some scholars is considered to be one of the most advanced life skills to taught and developed. Bloom’s taxonomy of learning and revised Anderson’s taxonomy suggest that children first learn to remember, then to understand, then to apply the knowledge, then to analyze and finally to think critically and evaluate it. (Hoskins, B, and Liu,L.,2019). Though earlier it was believed that these skills are best developed in the adolescent period, the present studies have argued that these skills can be learned at a much younger age and that, all learners, regardless of their ability levels, have found to have benefited from appropriate action and practice of critical thinking skills. (Lai,E.R, and Viering,M.,2012)

Empirical evidence identifies three core principles to teaching critical thinking skills-

1. Explicit instructions to develop critical thinking skills (*mapped against decided learning outcomes*).
2. Make critical thinking a separate component within each subject
3. Constructivist and critical pedagogy

Wherein the point 1 highlights the need and importance to teaching critical thinking explicitly where students already know they are being taught critical thinking and how they are expected to demonstrate their learning in behaviour, the point 2 underlines the need to integrate teaching of critical thinking within different subject domains. The third and one of the most important ways of developing these skills in the students is to practice critical and constructivist classroom pedagogy. Here the facilitator establishes a safe classroom learning environment where divergent point of views are accepted and appreciated, facilitator brings real world scenarios in classroom discussions, there is group and collaborative learning, and where the learners are kept in the center of the learning process. (Lai, E.R and Viering, M., 2012)

Some examples of successful interventions made to develop critical thinking skills are stated and discussed in the table below-

Name	Author(s) & year who validated the program	Location	Age group	Target outcomes	Method	Major findings
Youth Empowerment Strategies (YES program)	Wilson and others, 2008	USA	9-12 years old	Improved life skills	After school programme using photovoice..	Eleven of 12 groups in YES! critically reflected on their local contexts, constructed social activities projects, and implemented them to make positive changes in their communities
ARDESOS program (Argumentation, Decision, Solving of problems in	Carlos Saiz and Silvia F Rivas	Spain	Adolescents and adults	Improved critical thinking skills	20-30 hours total of 90 mins sessions (almost 20 total	There was a measurable increase in the target populations CT skills.

real life situations)					sessions) where some cases were provided to students to argue about, suggest solutions and take decisions	
Evaluation of Argument Mapping as a method for developing critical thinking in students	Christopher Dwyer, Michael J Hogan and Ian Stewart	Newyork, USA	Undergraduate psychology students	Improved Critical thinking abilities	8 week online intervention program where Argument Mapping was used for building CT skills	Statistically relevant improvement in the treatment group compared to the control group.

According to Paul, teachers' instructions can support the students to develop an independent mind of their own. The teachers should facilitate the students to not just talk about the ideas related to their texts, but also come up with ideas that they would like to be discussed in the class, to find solutions to the problems that affect their daily lives. The teachers should routinely ask students point of views on a given topic, idea of issue. Students should be given tasks where they need to create their own categories of classification and should classify things/concepts. So, Paul has mainly discussed the idea of critical pedagogy in the classrooms. Denick and Exley have suggested the following four ways of building CT skills-focussed discussion, student led seminars, problem based learning and role plays. They have insisted upon small group teaching as one of the most effective ways of developing these skills.

There have also been research studies that have demonstrated that assignments given to students for research and presentations, critical analysis of papers by the scholars, taking essay exams compared to multiple choice questions, instructor's encouragement to students and use of their ideas in the classroom, have had a positive impact on students' critical thinking skills. (ten Dan and Volman, 2004). Tsui's longitudinal study on instructions that improve critical thinking skills in study showed that by merely taking additional courses on women's studies, foreign language, math courses, history and science courses, interdisciplinary courses have led to an increase in students' CT skills.

It is important to underline here that most literature on building critical thinking skills state the difference between critical thinking or higher order thinking skills and critical thinking dispositions. The APA framework of critical thinking defines six core skills-interpretation, analysis, inference, evaluation, explanation and

self-regulation. Each core skill is also marked by a range of subskills. Along with these skills, effective dispositions like inquisitiveness with regard to a wide range of issues, concern to become and remain well informed, alertness to opportunities to use CT, trust in the processes for reasoned inquiry, trust in one's ability to inquire, open-mindedness regarding different world views, flexibility in considering views of others, honesty in facing one's biases, willingness to reconsider and revise one's views, orderliness while working with an issue, etc are considered important to be a critical thinker. (Heard, J., Scoular, C., Duckworth, D., Ramalingam, D., and Teo, I. 2020)

4. Assessing Critical thinking skills

Multiple critical thinking skills assessment tools (standardized) exist to assess different definitions of critical thinking skills. They are based on multiple themes and differ in their purpose, formats, and context. (Hoskins, B, and Liu, L., 2019). Though most of the tools are based on general content, some are subject specific tools too that measure the level of critical thinking skills of a student in the given subject domain (like language and math). Most of the assessments overlap in assessing important sub skills of critical thinking like analysis, reasoning, evaluation, etc. Some recent tools have also tried to capture critical thinking dispositions and metacognition.

The table below organizes some of the standardized assessment tools that have been developed, tested and used in different interventions for measuring cognitive skills and dispositions in the students.

Name of the instrument	Age group tested with	Brief description	Method	Link
Ennis Weir critical thinking Essay test (1985)	12-18 years	Open ended essay test. Measures general critical thinking abilities. It measures the abilities of the students to identify flaws in the given arguments and defend their arguments.	Open ended essay types questions	https://drive.google.com/file/d/1Af_Jz60TAE6TH_ZUGx6PpuKLoraEZCJP/view?usp=sharing
Watson Glaser Critical Thinking Appraisal	14 years and older	Standardized test that require the students to	Multiple choice questions can be administered online too. One	

(WGCTA)		attempt on range of exercises.	has to analyze the given arguments, etc.	
Halpern Critical thinking assessment using everyday situations	15 years and older	It has both open ended and multiple choice questions. It has questions set in real life situations.	Open ended and multiple choice. <i>(The tool isnt available but the examples for developing the tools are)</i>	https://archive.org/stream/Thought_and_Knowledge_An_Introduction_to_Critical_Thinking_by_Diane_F._Halpern/Thought_and_Knowledge_An_Introduction_to_Critical_Thinking_by_Diane_F._Halpern_djvu.txt https://drive.google.com/file/d/1VsrmjdlRG6C3yoRSOKaFH5Q27sD16MDd/view?usp=sharing
California Critical thinking skills test M series for children and youth (CCTST-M20, M 25, MIB)	8-15 years	M series test of California CT is a multiple choice test that measures different CT skills using real life situations. The test suggests a side assessment of dispositions too.	Multiple choice. Digital	<i>Have requested the main organization for sharing the tool for free</i>
California measure of mental motivation CM3	8-18 years	These tools help assess critical thinking dispositions in the students	The tool measures students learning orientation, cognitive integrity, scholarly rigour, etc. Digital	<i>Have requested the organization for the tool</i>
Cornell Critical thinking Test CCTT	10-18 years	Cornell test Level Z is to assess critical thinking skills in secondary and university students.	Digital. Multiple choice.	https://drive.google.com/file/d/1QRlk2-MVlbhmmArM6PTV3C7Lb5rMtlgp/view?usp=sharing <i>The above tool is</i>

		There is a level X too which is for elementary grades.		<i>form X</i> <i>Need to purchase the X form from-https://www.criticalthinking.com/cornell-critical-thinking-tests.html</i>
California Critical thinking Dispositions Inventory CCTDI	14 years and above	Measures critical thinking dispositions	Assesses important dispositions like open mindedness, confidence in reasoning, etc.	<i>Have requested access from insightassessment.com</i>
California Critical Thinking Skills Test CCTST	17-19 years old	General critical thinking skills assessment	Tests on pictures, political and general scenarios, etc	<i>Not available online</i>

Problem Solving:

1. Definition:

A review of research literature suggests that problem solving is one of the fundamental skills in life issues (Ahghar, 2012). Let us begin by understanding how we define problem solving, what constitutes problem solving competencies and related definitions.

Problem solving as defined in PISA 2012 relates to individuals working alone on resolving problems where a method of solution is not immediately obvious (OECD, 2010). The PISA 2003 Assessment Framework: Mathematics, Reading, Science and Problem Solving Knowledge and Skills defines problem-solving competencies as an individual's capacity to use cognitive processes to confront and resolve real, cross-disciplinary situations where the solution path is not immediately obvious and where the content areas or curricular areas that might be applicable are not within a single subject area of mathematics, science or reading (OECD, 2003).

Problem solving skills is an intellectual, logical and systematic method which helps individual when dealing with problems, to search for multiple solutions then, select the best solution with regard to the conditions (Ahghar, 2012).

Nezu (1989) defines problem-solving skills, as a cognitive - behavioral process that people detected by it, effective strategies for dealing with situations causing problems in daily life (Cassidy and Long, 1996).

2. Relationship between skills of problem solving and life outcomes:

Problem-solving skills, improve student performance in all courses (Kirkley, 2003; Nouri et al., 2010). Lazakidou et al (2010) suggested teaching problem solving skills enhances decision making, transmission, and self-governance and responsibility in the students. Mahmoud Radi (2006) suggested in his study teaching problem solving skills improve communication quality, increasing assertiveness skills, self-efficacy arousal, learning, self-discipline and self-seeking students makes. McMoran et al (2007) found that teaching problem-solving skills, increased ability to increase student understanding and personal skills as well as higher levels of mental health.

A research study conducted by Ghodsy Ahghar (2012) with sixty students from a school in Tehran also concluded that problem-solving skill training is effective in self-regulation learning of students and has good stability over time.

Bolhuis (2003) found that problem-solving skills training enhance and facilitate lifelong learning of students. Research results of Welch (2009) showed that training of problem-solving skills is effective in self learning, self-monitoring, and self-discipline of students.

Problem-solving skills training acts as a shield against negative events and cased to the active participation of students in the learning process (Ahghar, 2012).

3. Developing problem solving skills:

Problem solving skills building interventions have been employed at a large scale with students of different age groups and have been tested for their effectiveness in different areas. The following table details some of these studies/interventions and their effectiveness:

Name	Author(s) & year	Location	Age group	Target outcomes	Method	Major findings
Effects of problem-solving interventions on aggressive behaviours among primary school pupils in Ibadan,	Jibril Abdulmalik, Cornelius Ani, Ademola J. Ajuwon and Olayinka Omigbodun, 2016	Ibadan, Nigeria	12 years	assess the effect of group-based problem-solving interventions on aggressive behaviors among primary	Group-based intervention, which included problem-solving skills, calming techniques and attribution retraining. (https://ca	Group-based problem solving intervention for aggressive behaviors among primary school students showed

Nigeria				school pupils	pmh.biom-edcentral.com/articles/10.1186/s13034-016-0116-5)	significant reductions in both teachers' and students' rated aggressive behaviours with large effect sizes.
The effect of problem solving skills training on the social and emotional learning needs and abilities of 6th grade students	Tarik Totan ,Zekavet Kabasakal , 2012	Buca, Izmir, Turkey	11-12 years	Effects of the problem solving skills training program on the social and emotional learning needs, task articulation,peer relations and self-regulation	Problem solving skills training program	Problem solving skills training is effective in increasing task articulation,self-regulation and total score of social and emotional learning needs
Effect of Problem-solving Skills Education on Auto-regulation learning of High School Students in Tehran	Ghodsya Ahghar, 2012	Tehran	14-18 years	To assess whether teaching problem-solving skills has an effect on learning of student self-regulation & good stability over time.	Problem-solving skills training during 12 sessions, each session 2 hours in the experimental group was taught.	Problem solving skills education is effective in self-regulation learning of students and has a good stability over time.
Effects of Teaching Problem Solving Skills on	Ghodsya Ahghar, 2014	Tehran	14-18 years	Examine the effectiveness of teaching	Based on D'zarilla & Goldfield's problem solving	Social anxiety among the students who

Students' Social Anxiety				problem solving skills on reducing students' social anxiety.	model, the problem solving skills were taught to the experimental group during 12 two-hour sessions.	received problem solving skills training was significantly lower than the students who didn't receive the teaching
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4. Assessing problem solving skills:

The growing interest in problem solving in recent years as a transversal, transferable set of skills has led to the considerable expansion of the problem-solving literature and the development of several instruments that operationalize the concept (UNICEF and World Bank, 2019).

Some of the assessment instruments that have been used and proved to have sound properties to measure problem solving skills are:

Name of the instrument	Age group tested with	Brief description	Method	Link
MicroDYN to test CPS (Complex Problem Solving)	15 years old	Assesses the two core aspects of CPS: knowledge acquisition and knowledge application	Computer based assessment tool	MicroDyn approach
Social Problem-Solving Inventory (SPSI-R-SF)	13 years old and over	25-item measure of real-life problem-solving ability. comprises two functional scales—(a) <i>Positive Problem Orientation &</i>	Short form/questionnaire	Form not available for free access

		(b) Rational Problem Solving and three dysfunctional scales: (c) Negative Problem Orientation (d) Impulsivity/Carelessness Style (e) Avoidance Style		
Interpersonal Problem-Solving Assessment Technique (IPSAT)		Assess components of interpersonal effectiveness- overall problem solving process & response selection	Free-response test	http://teamvdf.fr/ee.fr/TER%20M1/test%20of%20interspers%20effect%201981.pdf
Everyday Problem Solving Inventory (EPSI)				

Creative Thinking:

- 1. Definition:**
- 2. Relationship between creative thinking skills and life outcomes:**
- 3. Developing Creative thinking skills:**
- 4. Assessing Creative thinking skills:**

Self Management:

- 1. Definition:**
Self regulation can be defined as the voluntary control of attentional, emotional, and behavioral impulses in the service of personally valued goals and standards

(Duckworth and Carlson, 2013). The term is interchangeably used with self-management, self control, self discipline, willpower etc. It is the individual's ability to regulate and monitor one's behaviours, emotions, feelings and impulses (UNICEF and partners, 2017).

In both the developmental sciences and a developmental psychopathology framework, emotion regulation and its component skills are viewed as basic capacities that can foster either typical and even positive development or atypical developmental outcomes, depending on their articulation and other social, dispositional, and biological resources available to the child (Eisenberg, Spinrad and Eggum, 2010).

2. Impact of skills for self-management on life outcomes:

Self-management skills are important because of the influence they have on building relationships with peers. Self-regulation remains perhaps even more important in the teen years, which are often marked by an increased vulnerability to risks such as truancy, peer victimization, and substance use. Adolescents who do not regulate their emotions and behavior are more likely to engage in risk-taking and unhealthy behaviors. Being able to suppress impulsive behavior and to adjust behavior as

appropriate has been linked to positive outcomes for children and adolescents (Bandy and Moore, 2010). A study published by the National Academy of Sciences found that boys and girls with less self-control had worse health, less wealth, and more crime as adults than those with more self-control.

The life outcomes of self-management includes:

- a) **Academic Impact:** It supports the goals of education such as improved attention, concentration, creativity, and emotional intelligence (Cowger & Torrance, 1982; Goleman, 1995; Mayer & Salovey, 1997). Substantial empirical evidence suggests that children's ability to regulate attentional, behavioral, and emotional impulses paves the way for success in school (Duckworth and Carlson, 2013). Studies conducted over time have consistently associated high self-control with strong academic performance (Tangney, Baumeister and Boone, 2004).
- b) **Impact on employment:** Young people with a strong social and emotional foundation can better thrive in a highly dynamic and skill-driven labour market by persevering and working hard (Skills for Social Progress, 2015).
- c) **Health Impact:** Individuals are more likely to avoid physical and mental illness by controlling their impulses and leading healthy lifestyles (Skills for Social Progress, 2015).
- d) **Social Impact:** High self-control was correlated with better interpersonal relationships, as indicated by better family cohesion and less family conflict. People with high self-control also had a more secure attachment style and

were less prone to the more problematic attachment styles (Tangney, Baumeister and Boone, 2004). Self-regulation is also linked with favorable perceptions by others. Children and adolescents who are able to control impulses and reflect on their actions are more likely to have friends and to get along with others (Bandy and Moore, 2010).

3. Developing skills for self-management:

Given the evidence of positive life outcomes of skills for self-management, there have been several interventions to foster these skills with varied groups.

Athletic and training programs can promote self-regulation. Sports and martial-arts programs, for example, have been found to improve children and adolescent's self-regulation skills (Bandy and Moore, 2010).

Some of the interventions to develop self management skills are listed below:

Name	Author(s) & year	Location	Age group	Target outcomes	Method	Major findings
Learning to Breathe	Patricia C. Broderick Stacie Metz, 2009	Pennsylvania, US	15-19 years	Awareness of thoughts & feelings, tools to manage negative emotions	Mindfulness curriculum	Reduction in negative feelings, increase in feelings of calmness, self-acceptance & improvement in physical health
The study of the effect of life skills training on social development , social and emotional compatibility among first grade female high school in Neka city	Zahra Roodbari, Esmail Sahdipoor and Seyyed Hamid Sadati Ghale, 2013	Neka, Iran	13-18 years	Social development , emotional compatibility, social compatibility	Life skills training sessions	Enhancement of social development, improved emotional and social adjustment
Penn Resiliency Program (PRP)	Martin E. P. Seligman, Randal M.	Diverse samples	8-15 years	Optimism, creativity, relaxation, decision making,	PRP model	Reduced symptoms of depression, reduced behavioral

	Ernst, Jane Gillham, Karen Reivicha and Mark Linkins, 2009			assertiveness, problem solving, and coping skills.		problems
Promoting Alternative Thinking Strategies (PATHS) Project	Greenberg and others, 1995	US	8-13 years	Social competence, adjustment, self-control, emotional awareness, social problem-solving skills	PATHS Curriculum	Reduced teacher and peer ratings of aggression, improved teacher and peer ratings of prosocial behavior, and improved teacher ratings of academic engagement

4. Measuring skills for self-management:

To assess the effectiveness of an intervention designed to foster the skills of self-management, certain measurement instruments have been tested and developed over time. The following table gives a brief of some of these measurement instruments:

Name of the instrument	Age group tested with	Brief description	Method	Link
The Positive and Negative Affect Schedule	Undergraduates	Mood scale-positive and negative affect	self-questionnaire	https://drive.google.com/file/d/1VR22VZ9L5942XOz9ACPvhWh8RKLqCxo9/vie

(PANAS)				w?usp=sharing
Self-Control Questionnaire	Adolescents	To measure self-control with respect to health (25% of the questionnaire assesses self control with respect to eating habits)		(figure out access to the scale)
California Personality Inventory (CPI)	Adolescents & older	scale to assess impetuosity, high spirits, caprice, and a taste for devilry	Self-assessment scale	https://www.skillsonline.com/Pdfs/smp210129.pdf
Fast Track Project Child Behavior Questionnaire	Children & adolescents	Used to assess the self-regulation skills of the respondents	self-questionnaire	https://drive.google.com/file/d/1RQOi7BfXZVz8ovupZuuESxD5HAXvLCVk/view?usp=sharing
Adolescent Self-Regulatory Inventory	Adolescents/teens	used to measure the self-regulation of teens	self-questionnaire	https://drive.google.com/file/d/1RQOi7BfXZVz8ovupZuuESxD5HAXvLCVk/view?usp=sharing
Self-Regulation Questionnaire (SRQ)	Adolescents/youth	Used to measure seven steps of self-regulation: receiving, evaluation, triggering, searching, formulating, implementing, and assessing	self-questionnaire	https://drive.google.com/file/d/1RQOi7BfXZVz8ovupZuuESxD5HAXvLCVk/view?usp=sharing
Brief self-control scale (BSCS)	Adolescents	To measure self-regulatory behavior in: -thoughts	Self-report questionnaire	https://scienceofbehaviorchange.org/measures/brief-self-control-

		-emotions -impulses, -performance.		survey/
Difficulties in Emotion Regulation Scale (DERS)	Adolescents	To measure the ability to regulate emotions	self-questionnaire	https://www2.psych.ubc.ca/~klorensky/publications/DERS18_measure.pdf

Resilience:

1. Definition:

According to Masten, Best and Garmezy (1990) resilience is defined as the process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances. Resilience is most often considered a personality characteristic that moderates the negative effects of stress and promotes adaptation. Resilience is further defined as the ability to successfully cope with change or misfortune (Wagnild & Young, 1993). Resilience represents the interaction between risk factors (vulnerability) and protective resources (protection). Interventions to improve health outcomes are aimed at enhancing resiliency in the effort to decrease high-risk behaviors (Ahern, Kiehl, Lou Sole and Byers, 2006). Resilience can be broadly defined as those skills, attributes, and abilities that enable individuals to adapt to hardships, difficulties, and challenges. Although some attributes are biologically determined, we believe resilience skills can be strengthened as well as learned. Proactive orientation, that is, taking initiative in one's own life and believing in one's own effectiveness, has been identified as a primary characteristic defining resilience in the literature (Alvord and Grados, 2005).

2. Impact of Resilience on life outcomes:

Resilience is often associated with a variety of necessary skills like being resourceful, flexible, having an available repertoire of problem-solving strategies and successful interpersonal relationships. The life outcomes of resilience have been studied over a period of time by a number of researchers. Some of the life outcomes of resilience are listed below:

- 1) Impact on academic performance: Educational aspirations (Tiet et al., 1998) and active engagement in academics (Morrison, Robertson, Laurie, & Kelly, 2002) have been associated with resilience. Cognitive ability has been found to be associated with resilience in children (Fergusson & Lynskey, 1996). It

also appears to exert a strong influence on other factors that contribute to resilience. For example, strong cognitive skills may allow youth to excel in school, as well as to make the most of educational opportunities and cultural experiences (Alvord and Grados, 2005).

- 2) Impact on interpersonal relationships: Resilient children elicit positive attention from others (Werner, 1993). Interpersonal relationships are also found to be interdependent with resilience, external influences that enhance resilience are competent parents, friendships, support networks, and effective schools. A child who can self-regulate is more apt to make friends and connect with others (Alvord and Grados, 2005).
- 3) Impact on physical and mental wellbeing: Most studies have suggested that resilient persons tend to manifest adaptive behavior, especially in the areas of social functioning, morale, and somatic health (Wagnild & Young, 1993). The resilient person has also been defined as an individual who does not succumb to illness (Caplan, 1990). Interventions to improve health outcomes are aimed at enhancing resilience in the effort to decrease high-risk behaviors (Ahern, Kiehl, Lou Sole and Byers, 2006).
- 4) Impact on leadership skills: Resilient individuals have a realistic, positive sense of self. They regard themselves as survivors (Wolin & Wolin, 1993). They feel that they can have an impact on their environment or situation, rather than just be passive observers. They are hopeful about the future. They are confident in their ability to surmount obstacles (Werner, 1993), make use of resources and opportunities around them, and view hardships as “learning experiences” (Werner & Smith, 2001).

3. Developing skills for Resilience:

Although resilience was initially seen as a fixed trait, it is currently considered a dynamic process that can be modified throughout life. This perspective involves cognitive, attitudinal, and behavioral aspects that can be learned. Therefore, resilience capacity can be enhanced based on strategies that develop these aspects (Pinto, Laurence, Macedo and Macedo, 2021).

Given that resilience can be strengthened with strategies that favor cognitive, attitudinal, and behavioral aspects, programs and interventions focused on

resilience have been developed and studied over time. Some of these programs and interventions have been listed below:

Name	Author(s) & year	Location	Age group	Target outcomes	Method	Major findings
Youth Resilience Framework	Rew and Horner, 2003	Not specified	12-18 (the program was used with vulnerable adolescents (homeless & vulnerable to health risks)	Reduction of health risk behaviors in adolescents	Promotion of Protective resources: Competent, Coping skills, Humor, Connectedness, Knowledge of health behaviors and risks	social connectedness, problem-focused coping, self-concept, and school engagement
Resilience-Based Intervention with Underserved Children	Brendan A. Rich, Nina D. Shiffrin, Colleen M. Cummings, Melissa M. Zarger, Lisa Berghorst & Mary K. Alvord, 2018	Washington, DC	9-12 years	Emotion regulation and positive and negative emotionality	Resilience Builder Program (RBP)	Significant gains in emotion regulation and significant reductions in negative emotions
Adolescent Resilience Model	Haase, 2004	US	Adolescents with cancer/chronic illnesses/parents having chronic illnesses (11-19 years)	Resilience (Confidence/mastery, Self-transcendence, Self-esteem) & quality of life (sense of well-being)	The Adolescent Resilience Model	<i>No significant study found on post testing findings</i>

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The Resilience Program	Delany and others, 2015	US	18 and older	Resilience capacity	cognitive behavioural therapy, and positive and performance psychology	Replacing stressful challenges with positive coping strategies offers a potentially powerful tool to build self-efficacy and cognitive control as well as greater self-awareness.
UK resilience Program (UKPRP)	The Young Foundation, 2007	UK	11-13 years	Cognitive skills, social problem-solving skills, assertiveness, negotiation and relaxation	UKPRP Curriculum (<i>access not available at the moment</i>)	Positive impact on pupils' depression and anxiety symptoms
FRIENDS	Dr Paula Barrett, 1988	Successfully tested in varied locations	Across ages	Prevent and treat anxiety in children and teenagers	Classroom intervention	Enables to cope with feelings of fear, worry, and depression
Resilient Therapy	Published by University of Brighton, evidence based studies	UK	children	Build resilience in disadvantaged children	The Resilient Therapy Magic Box	Positive outcomes in terms of resilience but not definitive for each case

	done by various researchers over time (2008, 2010)					
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4. Measuring skills for Resilience:

Name of the instrument	Group tested with	Brief description	Method	Link
Connor-Davids on Resilience Scale (CD-RISC)		Ability to adapt to change, deal with what comes along, cope with stress, stay focused and think clearly, not get discouraged in the face of failure, handle unpleasant feelings such as anger, pain or sadness.	self-administered scale	https://positivepsychology.com/connor-davidson-brief-resilience-scale/
Resilience Scale (RS)	39 undergraduates nursing students, now used widely for all groups	Identify the degree of individual resilience based on following components: equanimity, perseverance, self-reliance, meaningfulness & existential aloneness	self-questionnaire	https://drive.google.com/file/d/1PgltwgoI_OkiBVj1oJIVFemg1saiYmMn/view?usp=sharing
The Brief Resilience Scale (BRS)		measure one's ability to bounce back or recover from	self-questionnaire	https://pro.positivepsychology.com/tools/the-brief-resilience-sc

		stress		ale/
Adolescent Resilience Questionnaire	12-18 years	measures adolescents' resilience and their capacity to achieve positive outcomes despite stressors. It includes measures of resilience within self, and in family, school, peer, and community domains.	self-scored	https://www.rand.org/education-and-labor/projects/assessments/tool/2011/adolescent-resilience-questionnaire-arq.html

Communication:

1. Definition:

The importance of communication as a life skill, in all spheres of life has been highlighted over time. However, to understand the importance of communication as a life skill, one must define what do we mean by communication and what constitutes communication?

Communication can be broadly defined as a process of exchanging information, from the person giving the information through verbal and non-verbal methods, to the person receiving the information (Iksan et al., 2012). Communication has also been defined as sharing and giving meaning occurring at the same time through symbolic

interactions (Seiler & Beall, 2005). Communication has been said to start when a message or information is transferred from the sender (the speaker, writer) to the receiver (listener, reader) through an instrument or channel, and followed by the receiver giving feedback (coding and interpreting the information; Sulaiman Masri, 1997).

Based on these definitions, elements of communication include the person giving the information, the information and feedback by the receiver, and the repetition of these processes creates knowledge development (Iksan et al., 2012).

Now communication can be of different types. This can be broadly divided into:

- a. Verbal communication: The transmission of messages using words either written (written communication) or spoken (oral communication).

Oral communication refers to the use of words to communicate your message. This can happen face to face or through the use of technology. Written communication takes place in a written form. The common forms of written communication are letters, notices, emails, messages etc.

- b. Non-verbal communication: Nonverbal messages include images, actions and behaviors used to communicate. Images include photographs, film, charts, tables, graphs, and video. Nonverbal behaviors include actions, body language, and active listening. Actions and body language include eye contact, gestures, facial expressions, posture, and appearance.

2. Impact of Communication skills on life outcomes:

As discussed earlier, the impact of communication skills in different areas of life is a well-studied area and has been documented through numerous studies. Some of the broad areas where communication skills play a significant role have been listed below:

- a. Impact on Interpersonal skills: Communication is one of the most basic elements of human functioning, because it is the cornerstone of strong, healthy interpersonal relationships. Interpersonal relationships begin and develop through communication (EROZKAN, 2013). Being able to effectively communicate has been found to result in positive outcomes such as improved family, peer and group relationships (Brewer, 2013). To conclude, our ability to create and sustain our social world depends in large measure on how well we communicate (Hargie, 2019).
- b. Impact on employability/career success: Interpersonal competence [learning to be empathetic, sensitive and make friends easily] and interpersonal communication skills [ability to express oneself, listen, or resolve conflicts] are among the life skills and assets that youth need to succeed (Brewer, 2013). Communication skills are highly correlated to problem-solving and conflict resolutions skills (ibid). There is evidence that communication skills are related to three of the workforce outcomes studied for youth, they are the most frequently sought skill among employers (Lippman et al., 2015)
- c. Impact on physical and mental wellbeing: People's social skills are crucial to their well-being – individually and collectively (Hargie, 2019). Competence in communication is vital for our health (Hannawa & Spitzberg, 2015). Studies have shown a clear and positive relationship between effective interpersonal skills and a range of benefits such as greater happiness in life, resilience to stress and psychosocial problems (Müller et al., 2015).

- d. Impact on Leadership skills: The ability of leaders to interpret others' messages and to construct messages for others is a key to effective leadership. Individual messages and interlocked sequences of messages become the primary means through which leadership is exercised (Barge, 1994).

3. Developing skills for communication:

Children's referential communication performance improves over age (Glucksberg, Krauss, & Higgins, 1975). Development of the ability to take the other's perspective is a main component in the development of good communication skills (Asher and Wigfield, 1980). The development of communication skills happens through a variety of models, including this development taking place naturally over time and through designed interventions in different environments (school, home, community etc.)

Improved performance over age could be due to the acquisition of a more elaborate vocabulary or knowledge-base or due to increased awareness of the need to engage (ibid).

Some of the interventions that have been employed to develop the skills of communication are given as follows:

Name	Author(s) & year	Location	Age group	Target outcomes	Method	Major findings
Training referential communication	Shantz and Wilson, 1972	<i>Not-specified</i>	7 years	Exploratory intervention: whether communication skills can be improved through training children to be more aware of listener needs.	Controlled curriculum on speaking, listening etc.	Improved performance on description and discrimination tasks
Communication Skills Training (CST)	Dickson, Hargie, & Morrow, 1997	<i>Not specified</i>	Adolescents and adults	Ability to interact successfully in profes-	Microtraining method	Enhancing communication skills,

				sional situation		knowledge, and professional fulfillment
Enhancing Students' Communication Skills Through Treffinger Teaching Model	Idrus Alhaddad et al., 2015	Ternate, Indonesia	University students (age not specified)	Exploratory study to investigate the achievement and enhancement of students' mathematical communication skills (MCS) when taught through Treffinger Model	Treffinger Model	Achievement and enhancement of the students' communication skills in mathematics learning by using Treffinger model were higher
Presentation self-efficacy: Increasing communication skills through service-learning	Mary L. Tucker, Anne M. McCarthy, 2001	US	Business students (age not specified)	To position service learning as a model to increase communication skills	Service-learning (experiential education: students do a project for a non-profit)	Improves students' self-efficacy & confidence

4. Measuring skills for communication:

Name of the instrument	Group tested with	Brief description	Method	Link
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Interpersonal Communication Inventory	Adolescents and older	Study of the degree and patterns of communication in interpersonal relationships, sample the dimensions of self-concept, listening, clarity of expression, difficulties in coping with angry feelings, and self-disclosure	Self-questionnaire	https://drive.google.com/file/d/1jqKnNkuAaBvSHtNi0Vxb1NWE-NTgez2zU/view?usp=sharing
Communication skills inventory		Measures the cognitive, affective, and behavioral aspects of communication		

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