Cross-Cutting Capabilities: Support and Knowledge Among Parents/Caregivers

Nola Daley, Dana Murano, and Jeremy Burrus

The ACT® Holistic Framework® describes the knowledge and skills that students need for success during their kindergarten through postsecondary education and throughout their careers (Camara et al., 2015). The four areas included in the framework are core academic skills, behavioral skills, education and career navigation skills, and cross-cutting capabilities (CCCs). We recently examined parent/caregiver support for behavioral skills, also known as social and emotional skills (Daley et al., 2022). In the current paper, we continue to examine parent/caregiver support and knowledge of non-cognitive skills by focusing on the CCCs. The CCCs are a collection of skill sets that can be used in various domains to help students gain knowledge, communicate effectively, and solve problems (Lansing-Stoeffler & Daley, 2022). The CCCs include (a) critical thinking, (b) creative thinking and innovation, (c) collaborative problem-solving, (d) information and communication technology, and (e) self-directed learning. Table 1 provides the most updated definitions (Lansing-Stoeffler & Daley, 2022) for each of the CCCs and the skills included in each area.

Many leading educational organizations consider the CCCs essential to student success (e.g., National Research Council, 2012; Organisation for Economic Co-Operation and Development, 2019; World Economic Forum, 2019). Consistent with this emphasis, research supports the role of CCCs in contributing to important academic outcomes. For example, all five CCCs are related to academic performance, learning, and/or motivation (e.g., Dent & Koenka, 2016; Facione, 1991; Laal & Ghodsi, 2012; Mo, 2011; Yang & Zhao, 2021). Given the importance of the CCCs, the current study aimed to examine parent/caregiver knowledge of these skill sets and their support for teaching these skills in school.

Table 1. Cross-Cutting Capabilities Definitions and Skills

| Cross-cutting capability	Definition	Skills
Critical thinking	The skills and processes that support the critical consideration of ideas and information for the purpose of making a determination or judgment	Inquire Analyze and evaluate Synthesize Expand
Creative thinking and innovation (Creativity)	The skills and processes involved with the generation of ideas that are unconventional, original, or innovative	Conventional thinking Unconventional thinking Diverse thinking Evaluate and improve
Collaborative problem-solving	The social and cognitive skills and strategies required to collaborate with a group to work toward a common goal	Inclusion Clarity Commitment Communication Problem orientation Strategy Execution Monitoring and evaluation
Information and communication technology	The technology knowledge and skills required to effectively acquire and apply information	Plan Locate Evaluate Collect Transform Share
Self-directed learning (Learning skills)	The skills and knowledge needed to use strategies to manage learning, monitor progress, and make adjustments to achieve the learning goals	Identify task Set goals Plan Implement Monitor Adjust Reflect Adapt

To examine parent/caregiver knowledge and perceptions, we surveyed a group of parents/caregivers of students taking the ACT® test. Parents/caregivers were informed that the survey was voluntary, and no incentives were given. The survey was sent to 25,000 parents/caregivers of ACT test-takers following the April 2, 2022, National ACT test administration: 1,349 parents/caregivers began the survey, 1,074 completed at least one block of the survey, and 477 completed the entire survey. The survey focused on five school programs with names corresponding to the CCCs: (a) critical thinking, (b) creativity, (c) collaborative problem-solving, (d) information and communication technology, and (e) learning skills. We changed the names of two programs in the CCC framework to use more commonplace terminology: creative thinking and innovation became creativity[1]; self-directed learning became learning skills.

To examine their familiarity with each program, we asked respondents to rate how familiar they are with each program on a 1 (not familiar) to 4 (very familiar) scale. To examine their support for each program, we asked them to rate how supportive they are of each program being taught in school on a 1 (very unsupportive) to 6 (very supportive) scale. Samples sizes were 1,074 for familiarity ratings and 929 for support ratings. Figure 1 shows the percentage of respondents who reported some level of familiarity (i.e., somewhat familiar, very familiar). Figure 2 shows the percentage of respondents who reported some level of support (i.e., somewhat supportive, supportive, very supportive) for the CCC programs.

Figure 1. Parent/Caregiver Familiarity Ratings for Each CCC Program
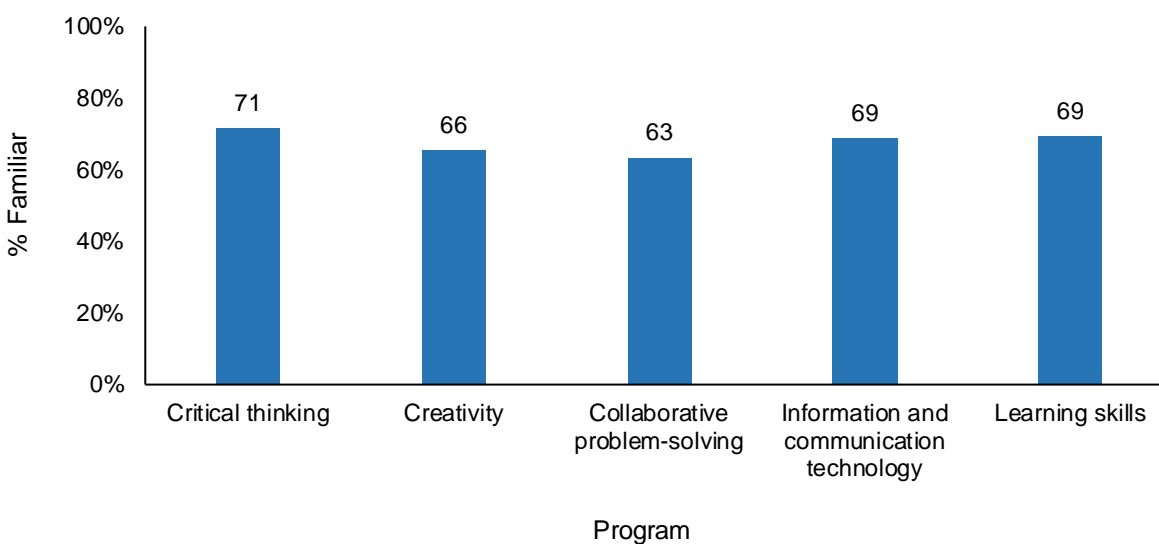
Note. Shown here are the percentages of individuals who reported they were somewhat familiar or very familiar with each program.

Figure 2. Parent/Caregiver Support Ratings for Each CCC Program
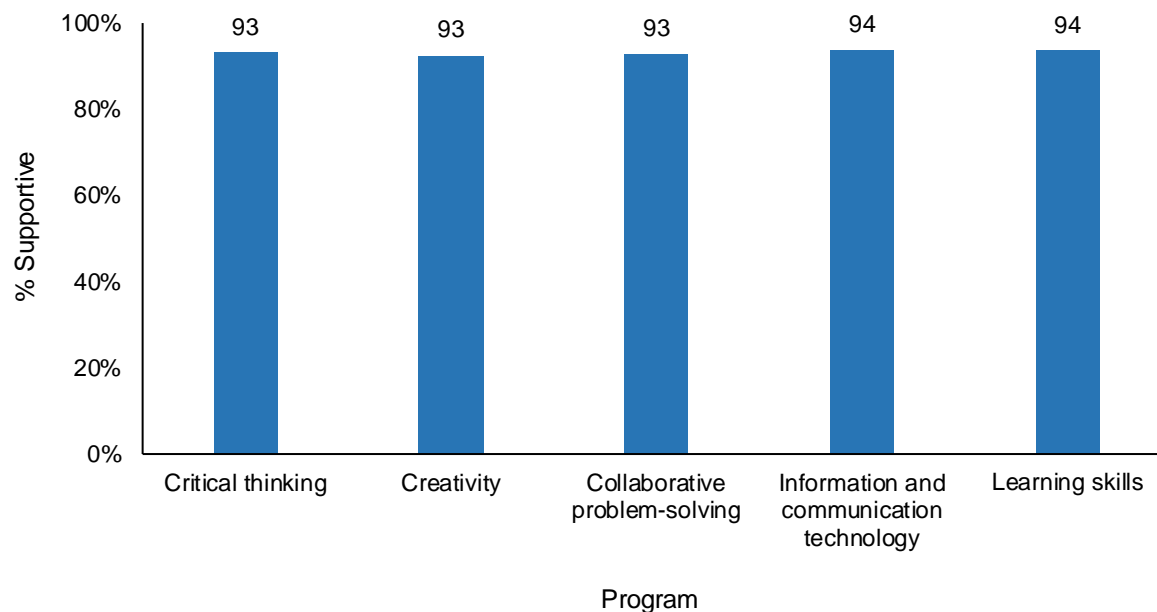
Note. Shown here are the percentages of individuals who indicated they were somewhat supportive, supportive, or very supportive of each program.

In addition to examining their self-reported familiarity and support, we were interested in parent/caregiver perceptions of these programs. To capture parent/caregiver perceptions, we asked respondents in an open-ended format to list three skills they thought would be taught in each program. We examined all open-ended responses to determine which skills parents/caregivers listed most frequently. Table 2 displays the top 20 most frequent skill and non-skill responses for each program. After determining the 20 most frequent responses, we used a binary coding scheme to differentiate skill responses that could or could not be categorized according to a relevant CCC definition. We used the recently updated CCC framework and definitions for this coding (Lansing-Stoeffler & Daley, 2022). Table 2 shows the degree to which skills listed for each category aligned with each category's respective CCC definition. Skills categorized by their corresponding CCC definition are marked ** and highlighted gray. When a skill did not correspond directly with its relevant definition, we used a binary coding scheme to determine if the skill would correspond with any of the other CCC definitions. Skills relevant for another CCC definition are marked * and highlighted yellow, and skills not corresponding with any CCC definition have neither * symbols nor highlighting.

Table 2. Top 20 Skills Listed for Each CCC

Critical thinking	Creativity	Collaborative problem-solving	Information and communication technology	Learning skills
Problem-solving (140)*	Art/Art appreciation/ Visual arts (134)	Teamwork (88)**	Computer science/skills (85)**	Study/Study skills/ techniques (106)**
Analysis/Analytic thinking (104)**	Out-of-the-box thinking/ Problem-solving (76)**	Communication (75)**	Coding (58)	Time management (80)**
Research (46)**	Problem-solving (75)*	Group projects/ assignments (51)	Computer programming (48)	Note-taking (72)**
Evaluating information (42)**	Music (67)	Listening (50)**	Communication (41)**	Reading/Reading comprehension (68)
Logic (38)**	Writing (64)	Working with others or in groups (43)**	Technology/Using technology (39)**	Organization/Organizing (59)
Asking questions/ Questioning (25)**	Brainstorming (60)**	Leadership (30)	Microsoft Office use (Word, Excel, PPT) (38)**	Learning styles (32)
Observation (24)	Imagination (34)**	Problem-solving (29)**	Internet/Accessing information (28)**	Listening/Listen/Active listening skills (31)
Reasoning (19)**	Idea generation/ creation/development/ exploration (29)**	Assigning tasks/Delegating (27)**	Keyboard/Typing (25)**	Test planning/taking/ strategies (31)**
Debate (18)**	Thinking (29)**	Brainstorming (27)*	Research (25)**	Writing skills (31)
Decision-making (18)**	Experimentation/ Exploration (21)*	Identifying problems (24)**	Social media (25)**	Communication (25)*
Reading (18)	Expressing/Expression (18)**	Team building (20)**	Appropriate use of phones/social media (21)**	Memorization/Memory strategies (25)**
Inferences/Inferential thinking (17)**	Analyze/Analysis/ Analytic (14)*	Conflict resolution (19)	Email (21)**	Research/Research skills (24)*
Math (17)	Drawing (14)	Respect (16)**	Software (20)**	Problem-solving(19)*
Finding solutions (16)**	Open-minded (14)**	Sharing ideas (15)**	Online safety/privacy/ security (19)**	How to learn/Learning skills (17)**
Identifying problems (15)**	Project based/Projects (13)	Discussion (13)**	I don't know (17)	Math/Basic math/skills (17)
Interpretation (15)**	Self-expression (13)	Collaboration (12)**	Data analysis/analytics (16)**	Comprehension (15)**
Communication (14)*	Artistic (12)	Considering others' ideas/points of view (12)**	Using multiple platforms/programs (16)**	Responsibility (15)
Data analysis (13)**	Design (12)	Research (12)*	Presentations (12)**	Scheduling planning/ Calendar use (14)**
Fact collection (13)**	Innovation/Innovator/ Tools (12)**	Analysis/Analytic thinking (12)*	Writing (12)	? (12)
Think outside of the box (13)*	Perspectives (10)*	Compromise (11)	Identifying trustworthy sources (12)**	Independent learning/ research (12)**

Note. Frequencies are shown in parentheses next to each response; gray** = skills corresponding with relevant CCC definition; yellow* = skills corresponding with another CCC definition; no * symbol or highlight = skills not in CCC framework.

Taken together, results from this study suggest that parents/caregivers are moderately familiar with CCC programs. Across the five programs, an average of 68% of parents/caregivers reported some level of familiarity. Furthermore, their top open-ended responses were somewhat consistent with the definitions of these skill sets. Creativity and learning skills had the lowest overlap, with 8 and 9, respectively, out of the top 20 open-ended responses corresponding with the definitions. Lower levels of overlap with these responses may reflect the difference in terminology used for these two terms in the survey versus in the CCC framework. As such, this lower level of overlap suggests that these terms are not perceived by parents/caregivers as the corresponding terms are described in the CCC framework. Future research can examine if greater overlap occurs when the more specific terminology in the CCC framework is used (i.e., creative thinking and innovation or self-directed learning). Greater overlap of these terms would support using this more specific terminology to ensure greater clarity and understanding. In contrast, over half of the top responses for the remaining programs corresponded with the relevant CCC definitions. Overlap ranged from 13 out of the top 20 responses for collaborative problem-solving to 16 out of the top 20 responses for information and communication technology. These results show considerable overlap between parents'/caregivers' understanding of these skill sets and the CCC framework definitions.

Although knowledge of these programs was moderate, support ratings for these programs were relatively high. Across the five programs, an average of 93% of parents/caregivers reported some level of support. The moderate familiarity and relatively high support suggest that parents/caregivers may not be strongly basing their support ratings on their knowledge level. Indirect support for this possibility stems from the small correlation between familiarity and support across the programs examined in this study ($r = .096$, $p < .001$, $n = 4,645$). This finding suggests other factors may lead to higher levels of support, such as perceived benefits of these programs. One additional caveat is that familiarity was rated on a 4-point response scale, whereas support was rated on a 6-point response scale, thus limiting the ability to make direct comparisons between the two. Future research can examine the factors influencing support ratings for these and other potential school programs. Nevertheless, the high levels of support are consistent with leading educational organizations' emphasis on the importance of CCCs for classroom success and with their research showing the benefits of these skills for student learning. These findings further underscore the importance of a holistic approach to preparing students for education and career success beyond developing core academic skills.

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Note

1. We recognize that the term *creativity* can sometimes be used to refer to perceptions of creativity as a skill set focused on artistic talents (e.g., music, writing, visual arts). This contrasts with our definition of creative thinking and innovation as specified in the ACT Holistic Framework (see Table 1). Nevertheless, we included the data on creativity here because we expected parents/caregivers to view these terms as having a similar meaning. As noted in the discussion, future research can examine if parents'/caregivers' perceptions differ for these terms.

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