

## Teaching project management to primary school children: Exploring the perspectives of project practitioners

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Project management knowledge and skills are an important component of the Australian Curriculum. The Australian Curriculum, Assessment and Reporting Authority calls for the explicit teaching of project management in primary school. However, it is uncertain if teachers possess the knowledge required to provide explicit teaching of project management, and to what extent it is being taught in primary school. To support the efforts of educators, seventeen project management experts were recruited to provide their perspectives. The Delphi method was used for consensus-building and the identification of core project management hard and soft skills. The findings revealed ten hard skills and twenty soft skills, ranked in order of importance and difficulty level, that children require to successfully manage projects. This study has significance for the project management profession by including the perspectives of industry practitioners on the skills required to successfully manage projects. It also provides educators with an evidence-based perspective for the design and delivery of project management content.

### Introduction

The Australian Curriculum was designed to provide students with the knowledge and skills to navigate work and life in the 21st century (ACARA, 2012a). The curriculum includes a *Technologies* learning area that enables students to become successful innovators by creating technological solutions (ACARA, 2012b). Creating solutions is the central focus of the Technologies curriculum, and involves the use of computational, design and systems thinking (ACARA, 2012b). It also requires project management skills to plan, organise, control, and monitor projects to realise these solutions (ACARA, 2022a). As such, project management plays an important role in the Australian Technologies curriculum, as illustrated in Figure 1.

ACARA believes that project management should be addressed in every year of schooling (ACARA, 2012b, p. 10). Further, it should be taught through a model called *explicit teaching* (DTiF, 2020) which breaks down the delivery of content into small components, gradually releasing control from the teacher to the student as the latter gains mastery of each area (Ashman, 2019). Explicit teaching is one of several direct instructional techniques supported by cognitive load theory, which is particularly suited to “the acquisition of domain-specific knowledge via new instructional procedures” (Tricot & Sweller, 2014, p. 278). This is important because the knowledge and skills required in technical domains such as mathematics, science and technology are not intuitive to novices and must be obtained through explicit teaching (CESE, 2017), followed by students practising what they have been explicitly taught while receiving corrective feedback (Clark et al., 2012).

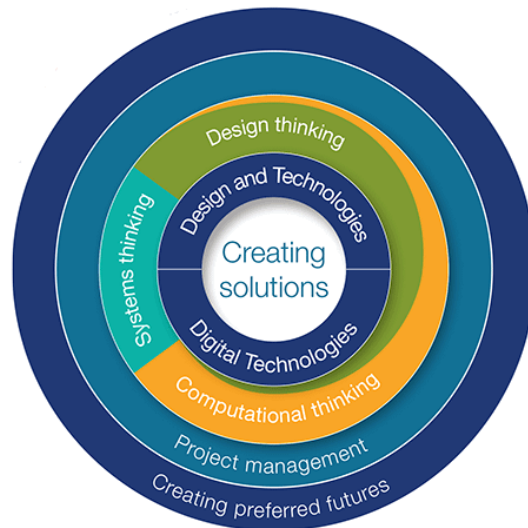


Figure 1: Project management role in the Australian Technologies curriculum  
From ACARA (n.d.), Figure 1.

However, unlike mathematics, science, and technology, it is unclear if the level of knowledge required to provide explicit teaching in such a technical domain as project management is present in Australian primary schools. For direct instructional techniques to be effective, domain-specific content must be chosen carefully to avoid misconceptions, and include concrete examples that are expertly selected and sequenced (Turner, 2019). The interdisciplinary nature of the topic provides an additional challenge since the exploration of problems and questions are not limited to a single discipline (NAS et al., 2005). Understanding the pedagogical delivery of domain-specific content in primary school requires dialogue with educators. Equally important is an understanding of the domain being explicitly taught, in this case project management, through the perspectives of industry practitioners.

The Project Management Institute (PMI) defines project management as “the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements” (PMI, 2021, p. 245). It is a complex discipline with many integrated components that must be managed effectively to deliver successful projects (PMI, 2017a) and has evolved over the decades from leading institutions such as the Project Management Institute, International Project Management Association (IPMA), and Association for Project Management (APM). At the nucleus of every project is a project manager (Kerzner, 2022) who is responsible for producing agreed deliverables within the specified constraints of time, cost, scope, and quality (PRINCE2, 2017). These individuals require a range of core competencies that include both the technical knowledge specific to the discipline and the interpersonal skills required to manage and work with people in projects. One way to view these technical and interpersonal competencies is to categorise them into hard skills and soft skills.

## Hard skills

Hard skills are the necessary abilities to perform a particular task or activity (Cimatti, 2016) and requires a high degree of domain-specific knowledge (Torres et al., 2020) and technical expertise (Marin-Zapata et al., 2021). Hard skills are synonymous with the technical skills required in project management (Zhang et al., 2013). The Project Management Institute has long been regarded as the leader in the project management industry (Drob & Zichil, 2013; Hodgson & Muzio, 2011; Richardson & Jackson, 2019). Its flagship publication: *A guide to the project management body of knowledge: PMBOK® guide* (PMBOK) (PMI, 2017a) is considered "the gospel of project management" (Kerzner, 2010, p. 169) and the technical standard within the industry (Creasy & Anantatmula, 2013; Starkweather & Stevenson, 2011; Wysocki, 2014). However, there are other leading publications too (APM, 2019; IPMA, 2018a, 2018b; PRINCE2, 2017). These standards provide a window into the ontology of the discipline (Morris et al., 2000).

The PMBOK includes ten *knowledge areas* that represent the hard skills required to learn the discipline (PMI, 2017a). They include integration management, scope management, schedule management, cost management, quality management, resource management, communications management, risk management, procurement management, and stakeholder management. These knowledge areas contain the required processes, practices, inputs, outputs, tools, and techniques to manage projects effectively and will also be referred to as hard skills throughout this paper. It is important to note that while there has been a shift from knowledge areas to *performance domains* in the latest version of the PMBOK (PMI, 2021), the latest edition of ISO's *International standard for project, programme and portfolio management* retains the knowledge areas, referring to them instead as *management practices* (ISO, 2020).

Table 1: Comparison of knowledge area rankings in previous studies

Rank	Zwikael (2009)	Rasid et al. (2014)	Javed et al. (2015)	Alwaly & Alawi (2020)
1	Time	Scope	Quality	Quality
2	Risk	Time	Time	Procurement
3	Scope	Cost	Communications	Integration
4	Human resource	Quality	Cost	Cost
5	Integration	Integration	Scope	Scope
6	Quality	Human resource	Stakeholder	Schedule
7	Communications	Communications	Integration	Resource
8	Cost	Procurement	Human resource	Stakeholder
9	Procurement	Risk	Procurement	Communications
10	n/a	n/a	Risk	Risk

Schedule Management was called Time Management prior to PMBOK version 6.

Resource Management was called Human Resource Management prior to PMBOK version 6.

PMBOK prior to version 5 did not contain Stakeholder Management; only nine knowledge areas.

Several studies over the past two decades (Table 1) have discussed project management hard skills by specifically referring to the PMBOK knowledge areas and ranking them in order of importance (Zwikael, 2009; Rasid et al., 2014; Javed et al., 2015; Alwaly & Alawi, 2020).

The studies in Table 1 indicate that the Time/Schedule, Scope, Quality and Cost knowledge areas are the most important hard skills within the discipline. They also align with what is commonly known in the project management profession as the *triple constraint*, where cost, time and quality are often traded off to achieve the project scope (APM, 2019; Schwalbe, 2019).

In a teaching context, hard skills are relatively straightforward to teach and assess compared to soft skills (Balcar, 2016; Lyu & Liu, 2021). Provided the teacher is knowledgeable in the particular hard skill they are explicitly teaching, that knowledge is “all the teachable skill that is required for expertise and competence” (Tricot & Sweller, 2014, p. 275).

### Soft skills

There is no universal definition for soft skills (Matteson et al., 2016). However, in their systematic review on the topic, Marin-Zapata et al. (2021) identified two types of soft skills: intrapersonal and interpersonal. Intrapersonal soft skills include traits such as self-reflection, independence, and motivation. Interpersonal soft skills are those utilised when relating to other people, such as communication, collaboration, and conflict resolution. All soft skills are useful for life in general, but particularly in collaborative projects (Lyu & Liu, 2021).

In the project management discipline, soft skills refer to the behaviours, attitudes, and personality characteristics when managing projects (PMI, 2017c). In a study on project complexity, Azim et al. (2010) argued that projects consist of three main attributes: people, process, and product. With *people* being the most significant factor in project complexity, the authors posit that project managers must exhibit exceptional soft skills. While soft skills are not domain-specific (Torres et al., 2020) and can be used across multiple disciplines (Gale et al., 2017), they do enable the application of technical knowledge in the workplace (Hendarman & Cantner, 2017) and the ability for hard skills to adapt to change when required (Cimatti, 2016).

There has been criticism that project management institutions and their publications focus too heavily on the education and certification of hard skills, with soft skills relegated to triviality (Ewin et al., 2017; Pant & Baroudi, 2008; Petter & Randolph, 2009). To bridge this gap, these organisations have published project manager competency frameworks (APM, 2015; IPMA, 2018a; PMI, 2017c) that include both sets of skills. PMI's *Project manager competency development framework* (PMI, 2017c) includes three dimensions of competency: knowledge, performance, and personal. The *personal* dimension includes several soft skills such as active listening, communicating, building relationships, conflict management, influencing, problem-solving and motivation.

There have also been several peer-reviewed studies on the importance of soft skills in project management (Alvarenga et al., 2019; Creasy & Anantamula, 2013; Davis, 2011; Keil et al., 2013; Muzio et al., 2007; Rezende & Blackwell, 2019; Skulmoski & Hartman, 2010; Stevenson & Starkweather, 2010; Zhang et al., 2013; Zuo et al., 2018). Table 2 includes three studies (Alvarenga et al., 2019; Keil et al., 2013; Zuo et al., 2018) that provide rankings for soft skills in project management. These studies clearly demonstrate that communication and leadership are the most important soft skills in project management.

Table 2: Comparison of soft skill rankings in previous studies

Rank	Keil et al. (2013)	Zuo et al. (2018)	Alvarenga et al. (2019)
1	Leadership	Teamwork/collaboration	Communication
2	Verbal communication	Cognitive skills	Commitment
3	Listening	Effective communication	Leadership
4	Written communication	Leadership	Decision making
5	People skills	Conflict management	Teamwork
6	Motivating others	Motivation	Negotiation
7	Negotiation	Adaptability	Conflict management
8	Organisation skills	Self-control	Customer relationship
9	Relationship building	Negotiation	Interpersonal relationship
10	Conflict management	Social awareness	Time management

*Note.* Keil et al. (2013) included hard skills in their ranking, which were omitted in this table.

The ranking for Zuo et al. (2017) was an aggregate of 12 literature sources.

The project management discipline requires project managers to possess a combination of these hard and soft skills to manage projects successfully. A number of these skills have been discussed, identified, and ranked in the previous studies cited in Tables 1 and 2. However, these studies were limited by country, industry, a subsection of the project management discipline (i.e., planning phase), or included participants from only one membership chapter of the Project Management Institute. Further, these studies were not conducted within the context of teaching project management to children.

The purpose of this paper is to explore the perspectives of industry practitioners on young children learning project management, which hard skills and soft skills are most important in project management, and which ones might be difficult for young children to learn. It is the first empirical study on teaching project management to primary school children from the perspectives of project management practitioners. It is hoped that this paper will assist educators and policymakers to provide comprehensive teaching approaches for young students learning project management.

## Methods

The following sections describes the process of identifying a panel of experts, the selection and ranking of hard skills and soft skills, and the consensus-building strategy known as the Delphi method.

## Delphi method

At the centre of the research methodology is the Delphi method. Meredith and Mantel (2009, p. 83) defined the Delphi method as a "formalized method of group decision making that facilitates drawing on the knowledge of experts in the group". Keeney et al. (2011) asserted that a common theme of this method is reaching consensus, the assumption being that a consensus among a group of experts holds higher validity than an individual's opinion (Murry & Hammons, 1995). The Delphi method has a number of other characteristics with associated benefits. Firstly, there are multiple rounds that often produce richer data than surveys (Okoli & Pawlowski, 2004). Secondly, anonymity provides freedom of expression (Vernon, 2009) and reduces the negative effects of dominant personalities and group pressure (Chalmers & Armour, 2019) while promoting an environment that encourages equal voice (Cohen et al., 2007). Finally, group feedback from multiple rounds is provided back to each participant to inform their next response (Avella, 2016) and facilitate the outcome of consensus (Green, 2014). Participants in this study were also given pseudonyms to protect their privacy, and care was taken to mask their location (aside from country), religion, cultural background, and job titles, as advised by Saunders, Kitzinger and Kitzinger (2015).

### *Level of consensus*

As advised by Chalmers and Armour (2019), we determined a target consensus rate for both hard skills and soft skills prior to the commencement of the Delphi study. In his review of the Delphi method, Vernon (2009) revealed that an agreement with 70% consensus was a common threshold, but values of 55% to 100% were also given. Delphi studies have often been terminated after achieving only a moderate consensus (Schmidt, 1997), or no consensus at all (Green, 2014; Keeney et al., 2011). Since the ten knowledge areas that constitute the hard skills utilised in project management were already pre-selected, a strong consensus would be sought. Regarding soft skills, we were less concerned about achieving a strong consensus on the ranking and more about identifying the most important soft skills. Therefore, a moderate consensus on ranking was deemed appropriate.

To assess the degree of consensus among participants, we used Kendall's coefficient of concordance ( $W$ ) (Chalmers & Armour, 2019; Keil et al., 2013; Schmidt, 1997). Kendall's  $W$  values range from 0 to 1, with 1 indicating a perfect consensus, and 0 indicating no consensus at all (Okoli & Pawlowski, 2004). Each level of consensus can be interpreted using Schmidt's (1997) categorisation of Kendall's  $W$ . However, we elected to simplify the interpretation of Kendall's  $W$  by reducing Schmidt's (1997) categories from 5 to 3 sections of equal size. Therefore, a Kendall's  $W$  of  $\leq 0.33$  was interpreted as a weak consensus, 0.34 to 0.66 as a moderate consensus, and  $\geq 0.67$  as a strong consensus. The main reason for this modification was that a Kendall's  $W$  of 0.49, for example, would be interpreted as a moderate consensus in this study, rather than a weak consensus according to Schmidt's (1997). The categorisation for both Schmidt's (1997) and this study are detailed in Table 3.

Bootstrapped 95% confidence intervals were calculated for Kendall's  $W$  using 10,000 replications. Bootstrapping generates "a large number of resamples, based on the original

sample ... computing the statistics of interest in each sample" (Franco & Reisen, 2007, p. 549). Analyses were conducted in Microsoft Excel (2021) and R statistical program software (R Project, n.d.).

Table 3: Categorisation of consensus levels

Schmidt (1997)		This study	
Kendall's $W$	Interpretation	Kendall's $W$	Interpretation
0.10	Very weak		
0.30	Weak	$\leq 0.33$	Weak
0.50	Moderate	0.34 – 0.66	Moderate
0.70	Strong	$\geq 0.67$	Strong
0.90	Unusually strong		

#### *Number of rounds*

A maximum of three rounds is a common termination point in Delphi studies (Chalmers & Armour, 2019; Green, 2014; Novakowski & Wellar, 2008), especially given the rising attrition rates following each round (Keeney et al., 2011). To avoid *panel fatigue* as described by Novakowski and Wellar (2008, p. 1497), this study allowed for a maximum of three rounds and panellists were made fully aware of, and committed to, multiple rounds (Grisham, 2009).

#### *Expert panel*

One of the early steps in the Delphi method is the selection of a panel of experts (Murry & Hammons, 1995). Drawing on Murry and Hammons' (1995) interpretation of domain experts as having superior knowledge within the domain, relevant work experience, or belonging to a professional association, strict criteria for the selection of project management professionals were enforced. Our selection criteria required that each panellist must (i) be a member of PMI; (ii) be *Project Management Professional* (PMP) certified; and (iii) have at least ten years of project management experience. These criteria meet the requirements suggested by Murry and Hammons (1995). Firstly, PMI is widely accepted as one of the leading institutions representing the project management community (Drob & Zichil, 2013; Hodgson & Muzio, 2011; Richardson & Jackson, 2019). Professional membership to such an organisation would meet the first criterion. Secondly, the PMP accreditation is considered the "gold standard" in project management certifications (Richardson & Jackson, 2019, p. 26), and demonstrates a degree of mastery over the technical aspects of project management. With over one million PMP practitioners worldwide (PMI, 2020), organisations are beginning to use the qualification as the minimum entry requirement for employment as a project manager (Thomas, 2014), which is an indication of the stature and pervasiveness of the qualification. Finally, ten years of experience working as a project manager, combined with PMP accreditation and professional membership at PMI, are strong indicators of a high level of expertise.

Project managers were approached and recruited from the Project Management Institute, with seventeen agreeing to participate in the study. Table 4 summarises the demographic profiles (a more detailed demographic profile is provided in Appendix A).

Table 4: Demographic profiles of expert panel (N=17)

Variable		Freq.
Project management experience (years)	10–19	7
	20–29	4
	30–39	6
Gender	Male	14
	Female	3
Continent	Asia	2
	Australia	3
	Europe	4
	North America	8

## Results and discussion

This section presents the results of this study. It is grouped into four sections: (i) the important project management hard skills and their relative importance; (ii) the important project management soft skills and their relative importance; (iii) which category of skills are deemed more important and why; and (iv) the panel's views on young children learning project management, and where, when, and by whom, they should be taught.

### Hard skills and their relative importance

In Round 1 of the Delphi study, panellists were asked to rank each PMBOK knowledge area (KA) in order of importance, with the top KA being most important and the bottom KA being least important. The top 5 KAs selected by the panel were communications, stakeholder, scope, risk, and integration. Panellists were also asked to explain the reasons for their top 5 selections. Their individual responses are detailed in Appendix B. The Kendall's  $W$  for Round 1 was calculated to be 0.45 (95% CI: 0.30 to 0.65), which represented a weak consensus according to Schmidt (1997), and a moderate consensus according to the categorisation scheme used in this study. There was strong evidence for agreement in this round (chi-squared (9) = 68.6,  $p < 0.001$ ). Since the target consensus requiring a Kendall's  $W$  of at least 0.67 was not obtained, the process was escalated to the next round. In Round 2, there was a total of 15 participants (88.2% response rate). The ranking of KAs from Round 1 was presented to the panel for consideration. Nine (60.0%) panellists agreed with the ranking from Round 1, leaving it unchanged in Round 2, while 6 (40.0%) elected to change the ranking. After Round 2, Kendall's  $W$  was calculated at 0.87 (95% CI: 0.79 to 0.96), which represented a strong consensus according to both categorisation schemes in Table 3. There was strong evidence for agreement in this round (chi-squared (9) = 117.7,  $p < 0.001$ ). The p-value, mean ranks, and Kendall's  $W$  for Rounds 1 and 2, along with the standard deviation for Round 2, are listed in Table 5.

Kendall's  $W$  almost doubled from 0.45 to 0.87 between rounds, which indicates a significant shift in agreement among panellists. With a final Kendall's  $W$  of 0.87, the target for consensus on the relative importance of hard skills was met.



Table 5: Initial and final ranking for knowledge areas

Rank	Knowledge area (KA)	Round 1 mean	Round 2 mean (SD)
1	Communications	2.65	1.20 (0.41)
2	Stakeholder	2.76	2.07 (0.46)
3	Scope	4.18	3.87 (1.25)
4	Risk	4.41	4.00 (0.53)
5	Integration	5.06	4.73 (1.62)
6	Resource	6.65	6.27 (1.87)
7	Schedule	6.29	6.47 (0.92)
8	Cost	7.00	7.93 (0.46)
9	Quality	7.12	8.60 (1.30)
10	Procurement	8.88	9.87 (0.52)
Kendall's $W$ (95% CI)		0.45 (0.30 - 0.65)	0.87 (0.79 - 0.96)
$p$ value		.001	<.001

*Note.* Round 1: N=17. Round 2: N=15.

While each KA is important, in the interests of brevity, the top 3 KAs will be discussed briefly. Communications management was the top-ranking KA according to the expert panel. Kerzner (2022, p. 228) defined communications management as "...the formal or informal process of conducting or supervising the exchange of information either upward, downward, laterally, or diagonally". An important KA within the PMBOK, it has the specific purpose of ensuring that a strategy is in place for effective communication between stakeholders and that the process of implementing that communication strategy is actually carried out (PMI, 2017a). Several panellists stated that project managers spend the vast majority of their time communicating (PM-03, PM-05, PM-09, PM-10) and that ineffective communication is a major cause of project failure (PM-02, PM-03, PM-12). In second place, stakeholder management was also deemed critical to project success (PM-01, PM-02, PM-03, PM-04, PM07, PM-08, PM-09, PM-13, PM-15). The stakeholder KA includes many concepts borne out of the communications KA (Schwalbe, 2019) and did not exist prior to the fifth edition of the PMBOK. This indicates the inextricable tie between the two KAs, and their significance by splitting the communications KA into two separate KAs. When asked why communications and stakeholder management were ranked at the top, PM-12 stated: "Because communication with stakeholders is critical to project success" with PM-05 adding that they are "at the heart of daily activity for PMs". Scope management was ranked in third place. In many respects, scope management is the foundation of project planning because it identifies, defines, and controls what is in and out of scope (APM, 2019).

In Round 2, panellists were asked which knowledge areas might be difficult for children aged between 5-11 years old to learn and apply in projects. The results are detailed in Table 6.

Cost and procurement management were ranked at 1 and 2 respectively in terms of learning difficulty. These two knowledge areas involve the financial, contractual, and sourcing side of projects. According to some participants, procurement management is "too complex and formal" (PM-06), "too abstract" (PM-03), and "simply not needed"

(PM-16). Cost management “requires financial literacy” (PM-07) and “budget management skills kids may not yet have” (PM-05). PM-08 believes that “the concept of money can be difficult for children. They may go in two completely different directions. They will either spend it as fast as they get it or save it and never spend”. PM-12 says that children are “not spending their [own] money, thus [they] don’t understand the need to create and stay within a budget and make trade-offs”. Interestingly, while cost and procurement management are the most difficult knowledge areas to learn and apply, they are also ranked low in order of importance, at 8 and 10 respectively (see Table 5). Therefore, they could be slowly introduced in the later years of primary school. The Australian mathematics curriculum encourages the development of consumer and financial literacy through activities such as creating budgets and financial plans, calculating percentages, and maximising value while purchasing goods and services (ACARA, 2022b). This presents an opportunity for primary school educators to introduce project cost and procurement management skills that align with the required mathematics curriculum for a student’s particular year level.

Table 6: Difficult knowledge areas for children to learn (N=15)

Rank	Knowledge area	Freq.	%
1	Cost	12	80.0
2	Procurement	10	66.7
3	Integration	9	60.0
4	Quality	6	40.0
5	Stakeholder	5	33.3
6	Risk	4	26.7
7	Schedule	4	26.7
8	Resource	2	13.3
9	Scope	1	6.7
10	Communications	0	0.0

In contrast to the previous example regarding cost and procurement management, communications and scope management are two knowledge areas that are very important in project management (ranked 1 and 3 respectively in Table 5) and least difficult to learn and apply (ranked 10 and 9 respectively in Table 6). Therefore, they should be introduced in the early years of primary school.

Understanding the important project management hard skills and which ones might be difficult for young children to learn can inform educators on how and when each skill is introduced to the student. It also highlights the knowledge areas that teachers may need to learn themselves in order to provide explicit teaching in the classroom. Whatever the structure and delivery of project management teaching looks like in the primary school classroom, educators will need to possess the relevant project management hard skills before explicitly teaching and assessing them.

### Soft skills and their relative importance

In Round 1, panellists were asked to nominate up to 10 soft skills they believed were necessary to manage projects successfully. A total of 167 soft skills were submitted. Duplicates were removed, and some soft skills were grouped together. For example, when soft skills had nearly identical names but with a slight variation, the most frequently used term was selected. The term “motivating” (PM-15) was replaced with *motivation*, as the latter term was most often used by panellists. Skills that were unique, but shared a common category, were grouped into that category. For example, “effective communication” (PM-03, PM-04, PM-10), “communication skills” (PM-02, PM-09), “written communication” (PM-08), and “concise communication” (PM-12) were categorised as *communication*, which again, was the most frequent term used among panellists. This process reduced the original list of 167 soft skills down to 70.

The reduced list of 70 soft skills, and the number of times each was nominated in Round 1, was presented to panellists in Round 2. They were then asked to select 20 soft skills each, in no particular order, that they believed were most important. The results are detailed in Appendix C. In Round 3, there was a total of 14 participants (82.4% response rate). The top 20 soft skills nominated by the panel in Round 2 were presented to panellists and they were asked to rank each skill in order of importance. The results are detailed in Table 7.

Table 7: Top 20 soft skills in project management (N=14)

Rank	Soft skill	Mean
1	Communication	2.00
2	Leadership	2.43
3	Emotional intelligence	4.71
4	Influencing	7.64
5	Negotiation	7.71
6	Facilitation	8.64
7	Adaptability	9.71
8	Listening	9.71
9	Conflict management	10.07
10	Teamwork	10.21
11	Problem solving	10.21
12	Decision making	12.57
13	Empathy	13.00
14	Resilience	13.50
15	Cultural sensitivity	13.86
16	Motivation	13.93
17	Collaboration	14.29
18	Integrity	14.36
19	Creative thinking	15.50
20	Critical thinking	15.93
	Kendall's $W$	0.48
	$p$ value	< .001

Kendall's  $W$  of 0.48 (95% CI: 0.40 to 0.67) revealed a moderate consensus on soft skills. As with the previous studies in Table 2, our panellists ranked communication and leadership at number 1 and 2 respectively. Emotional intelligence, which did not rank in the top 10 for any of the studies in Table 2, ranked at number 3 in this study. Emotional intelligence is the ability to perceive, express, and manage emotions in others and within ourselves (Cimatti, 2016) and is an underdeveloped soft skill in project management (Ewin et al., 2017). As with hard skills, we asked panellists to nominate which soft skills children aged between 5 and 11 years old might find difficult to learn and apply when managing projects. The results are detailed in Table 8.

Table 8: Difficult soft skills for children to learn (N=14)

Rank	Soft skill	Freq.	%
1	Cultural sensitivity	9	64.3
2	Conflict management	9	64.3
3	Facilitation	7	50.0
4	Empathy	6	42.9
5	Emotional intelligence	5	35.7
6	Leadership	4	28.6
7	Influencing	4	28.6
8	Resilience	4	28.6
9	Decision making	4	28.6
10	Critical thinking	4	28.6
11	Integrity	4	28.6
12	Negotiation	3	21.4
13	Listening	3	21.4
14	Motivation	2	14.3
15	Adaptability	1	7.1
16	Communication	0	0.0
17	Problem solving	0	0.0
18	Teamwork	0	0.0
19	Collaboration	0	0.0
20	Creative thinking	0	0.0

When comparing the results of Tables 7 and 8, several soft skills that are critical to project management are also difficult for children to learn and apply. Some of the soft skills in this category include emotional intelligence, facilitation, and conflict management. These would be areas for educators to focus on when teaching project management to children. Communication, problem solving, teamwork, collaboration, and creative thinking were not perceived as difficult to learn and apply by any of the panellists.

Teaching soft skills in the early years of primary school is a fundamental requirement (Cimatti, 2016). However, soft skills are difficult to develop and measure (Balcar, 2016). Matteson et al. (2016) suggested triangulating data from self, peer, and supervisor-reported data as an approach to measuring soft skills in an individual. However, this may not be appropriate in a primary school setting. While practitioners are best placed to identify and rank the soft skills required in project management, educators are critical in developing

and measuring them in primary school students. Further research is needed on the perspectives of primary school educators on how this might be achieved with respect to teaching project management.

### Which skill set is more important: hard skills or soft skills?

Panellists were asked if they were teaching project management to children aged between 5 and 11 years old, which category of skills would they focus on. The results are detailed in Table 9.

Table 9: Which category of skills is more important (N=17)

Category	Freq.	%
Soft skills	11	64.7
Hard skills	2	11.8
Both are equally important	4	23.5

The majority of panellists (PM-01, PM-02, PM-03, PM-06, PM-08, PM-09, PM-11, PM-13, PM-14, PM-16, PM-17) believed that soft skills were more important for children to learn when managing projects. Four panellists (PM-05, PM-07, PM-10, PM-12) felt that learning both sets of skills was equally important, while two (PM-04, PM-15) nominated hard skills as the most important category. The next section describes the reasons behind some of the selections.

Regarding soft skills, PM-09 believed that "...hard skills are less important for project success. The PM does not have to be an expert in the field, his job is to make the team shine. This is achieved by developing and using soft skills". Therefore, "building the foundation of soft skills comes first" (PM-17). During "...the first years it is imperative [to develop] the foundational citizenship soft skills. The rest we learn, unlearn, and relearn all through our life" (PM-13). While both are important according to PM-03, "...a focus on soft skills learning at an early age will provide a much greater return on investment". Contrasting both sets of skills, PM-01 believed that while "...the technical analysis work involved in schedules, cost and risk management would be generally beyond a child of that age, it is the development of soft skills [that] are vital yet founded on rather simple concepts".

Only two panellists believed that hard skills should be the main focus when teaching project management to children. As PM-15 explained, primary school children are "...more likely to possess some of the soft-skills..." already, so the focus should be on "...imparting knowledge on technical skills." PM-04 also supported a focus on hard skills because "soft skills are acquired through experience, [and are] difficult to be taught".

While the authors of this paper believed that the majority of panellists would agree that both sets of skills were equally important, only four panellists (23.5%) held this view. PM-07 asserted that "there might be moments when one set of skills is more important than the other, but both sets are equally important in [the] long term". PM-12 stated that

“when someone is learning project management, they need to understand the ability to work with people (soft) and the science (hard) of being a PM”. PM-05 added that without “...emotional intelligence a PM cannot sustain... project outcomes... at the same time a PM with low levels of technical project management ... will fail even if he or she has high EI.” PM-07 extended their response to include an example within a school context:

I would teach them both to prepare them for real life assignments. Of course, the set of skills need to be chosen appropriately for their age, e.g., a school science project is a good example. I saw results of my daughter over the years, she is 14 now. If she does not have soft skills, getting on with the rest of their small project team is very hard. They learn soft skills on the go because otherwise they really can't cooperate. But without the hard skills, they actually can't deliver the assignment itself, e.g., the subject of their science project. (PM-07)

There is a dichotomy that exists between the two sets of skills. While project management hard skills may be the easiest to teach and assess, they require educators to master the technical areas of the discipline in order to explicitly teach them. Soft skills, on the other hand, may be more familiar to educators and pervasive across the entire Australian curriculum, but they are difficult to learn and measure.

Regardless of what is perceived as more or less important, and more or less difficult to learn and measure, both sets of skills are required to learn the project management discipline. Figure 2 provides a visual illustration of the 10 hard skills and 20 soft skills in project management from Tables 5, 6, 7, and 8, and their importance and learning difficulty for children aged between 5 and 11 years old.

Educators might consider the quadrants in Figure 2 when designing project management learning content for primary school children. For example, the skills in the high importance / low difficulty quadrant may be a better option in the early years of primary school, while the skills in the low importance / high difficulty quadrant might be better suited in the later years.

### **Children learning project management**

The Australian Technologies curriculum is not alone in promoting project management learning in primary school. The *Partnership for 21st Century Learning* (P21), arguably the leading institution on 21st century learning, created a framework that focuses on the skills, knowledge and expertise required for children to successfully navigate life in the 21st century. Several soft skills cited in the P21 framework also appear in Table 7 of this paper.

Most significantly, the P21 framework specifically includes project management as a key 21st century skill (P21, 2019, p. 7). However, what is unclear in the literature is: (i) should primary school children even learn project management; (ii) what is the appropriate age to start learning the discipline; (iii) who should teach it; (iv) should those who teach it be trained; and (v) what is the best learning environment. The panel was asked a series of questions based on these queries.

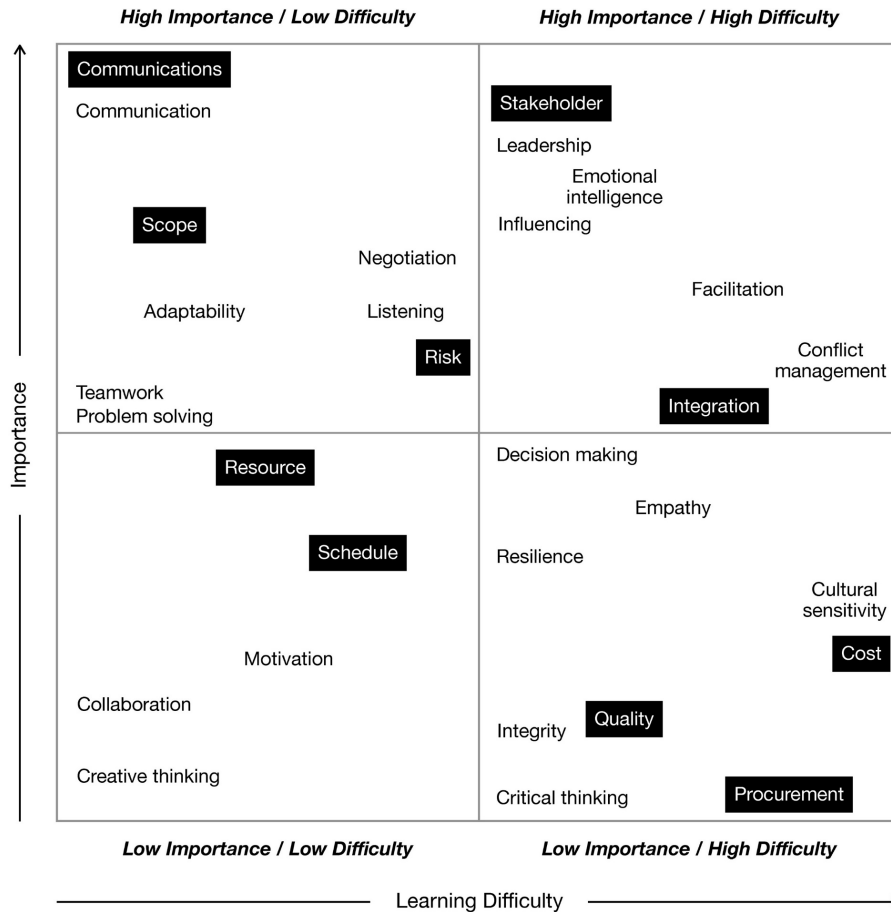


Figure 2: Importance vs learning difficulty of PM hard/soft skills

Note. Text in black boxes indicate hard skills. Soft skills are in black text. While the positioning of skills is not precisely to scale, the priority order and quadrant allocation is reflective of the results.

*Should children aged between 5 and 11 years old learn project management?*

The results are detailed in Table 10. All but one panellist (94.1%) agreed that primary school children should learn project management and were asked to explain their response. PM-05 stated that project management is "...a life skill. Most important choices and plans in life involve the management of a de facto project. This includes their education, a job search, a wedding, etc." Learning the discipline "...prepares them for real life situations when they need to deliver results in teams" (PM-07). PM-12 added that "...whether you're leading a team or a member of one, everyone should understand what a project is and project management in general". The sole undecided panellist believed that children should focus on "...a task to deliver something somebody wants" rather than formal project management.

Table 10: Should children learn project management? (N=17)

	Yes	No	Undecided
n	16	0	1

Several panellists mentioned future careers as a benefit of learning project management early. “Success in any field requires a basic level of project management skills. As such, I strongly believe that learning PM skills will certainly help kids in their careers” (PM-15). PM-09 believed that society is transitioning to a “...projectised economy. Teaching project management to a child will help him not only in his career but also in his private life”. This sentiment was echoed by PM-03: “...starting the learning process at an early age will help kids to bootstrap their careers”. With organisations expected to rely on approximately ninety million project management-oriented roles by 2027, and an increasing gap between demand and supply for professionals to fill these roles (PMI, 2017b), project management skills will certainly be valuable to employers.

*When should children first learn project management?*

The results are presented in Table 11. Eleven panellists (64.7%) believed that the best time to start learning project management is between 5 and 11 years old, or primary school age. This age group has “...high potential in terms of thinking and doing” (PM-02), and is “...old enough to have overcome basic learning challenges and able to interact with one another in small groups towards a common goal” (PM-03). The “basic concepts of project management can be broken down for children of 5-11 years old which could become very helpful in school life for 12-17 years old...setting the foundations early is critical” (PM-01). One panellist, PM-13, simply stated: “the sooner the better”. Three panellists (PM-04, PM-09, PM-10) were more cautious, suggesting that project management learning may be better suited to secondary school, since “...you have enough knowledge to start diving [into] project management” (PM-09). Finally, PM-08 selected *any* age range: “...the toddler stage may be a little young, [but] all of the options make sense. Of course, the level of project management may be lighter for younger children, but there are skills they can start applying at any age”.

Table 11: When should children first learn project management? (N17)

	0 - 4	5 - 11	12 - 17	Any	Undecided
n	1	11	3	1	1

*Who should teach project management to children?*

The results are detailed in Table 12. Aside from a *teacher* or *parent*, one of the selection options for this question was a *PMP* certified practitioner, a qualification that all members of the expert panel hold. A strong consensus (70.6%) agreed that a schoolteacher is the best person to provide project management instruction to children. “At this age, you need someone with early childhood learning skills as they would likely know the best way to convey challenging concepts in an interesting manner. Kids at that age have very short attention spans” (PM-03). A teacher already has a “...strong relationship with the children



and is best placed to impart the level of knowledge being introduced at that age. The key will be designing a syllabus that is 100% aligned with children's capabilities" (PM-01).

Table 12: Who should teach project management to children? (N=17)

	Teacher	Parent	PMP	No reply
n	12	2	1	2

A few panellists did not think a teacher was the best option. However, if a "...parent is not available or willing, the second choice would be [a] teacher" (PM-08). The only panellist who felt that a PMP certified practitioner was most appropriate for teaching children was PM-10: "Project management is science. It is always great to learn it from a PMI professional".

*Should schoolteachers and/or parents receive project management training if they are teaching children project management?*

The results are detailed in Table 13. A large majority of the panel (82.4%) agreed that anyone who teaches project management to children should themselves be trained in the discipline. "It is fairly obvious, project management is a specialist discipline that must be learnt and ideally delivered before teaching anyone" (PM-01). A "qualified teacher [in] math or geography...must be trained in project management" (PM-11), and "...carefully developed and high-quality material should be provided to teachers and parents" (PM-15). The training should also "...align to the profession[s] curriculum" (PM-06), suggesting that pre-service teachers should have project management training incorporated into their syllabus. However, for educators already engaged in primary school teaching, this might involve professional development programs for example. Following training in project management, teachers could "...adapt the project language to the classrooms depending on children[s] potentiality" (PM-02). PM-08 is not certain that "...formal training is required for teachers to pass on these skills, especially the soft skills". This is an interesting point. As part of project management training and certification, even the PMP panellists in this study were not trained or tested on soft skills. As discussed earlier in this paper, the PMP certification exam is based only on the hard skills associated with the discipline.

Table 13: Should educators be trained in PM? (N=17)

	Yes	No	No reply
n	14	1	2

*What is the best environment for children aged between 5 and 11 years old to learn project management?*

The results are detailed in Table 14. The majority of panellists felt that a school environment was ideally suited to teaching project management to children. However, it is worth looking at some of the reasons why panellists selected different options.

Table 14: What is the best environment for children to learn project management?  
(N=17)

	School	Home	Community	Work	Other	No reply
n	10	1	1	1	2	2

PM-12 selected *home* because it is "...a safe environment with the tools and support needed to do their work...". There are some presumptions in this statement that are beyond the scope of this paper, however, it is worth noting that many children may not have the home environment as described by PM-12. PM-14 felt that a community program might be a good option to work with an "...independent team". Finally, PM-08 and PM-15 had interesting responses to why they selected *other*. "I actually think any and all of these are good environments. I cannot choose because I think it would depend on the child's situation and what is available to them" (PM-08); "...a combination of environments should be used, with different types of content for each environment. It should ideally be a combination of school, home, and community programs. I believe that this combination may change from one culture to another" (PM-15).

### Final thoughts from project practitioners

The final question to panellists gave them an opportunity to summarise their overall thoughts, feelings, and suggestions on the topic of teaching project management to primary school children. A few insightful responses are included in this section.

When learning something new, it is always best to focus first on what you do best and then expand on that. For example, expanding on empathy and emotional intelligence, the child can learn conflict resolution and negotiation. For the knowledge areas, several will come easier. Scope and quality are areas that I think they can learn first. Procurement and cost may be unfamiliar territory to many children. Some were not taught to use money at this age. Time management absolutely needs to be taught. This is an area that too many adults struggle with. Teaching a child this early may make the biggest impact in their lives over the other areas. I say this because my biggest struggle in work and personal relationships is the lack of time management by others. (PM-08)

Nothing is impossible to be learned, even at an early age. There are plenty of cases in history of talented children that mastered instruments, languages or mathematics before they were able to stand on two feet. Children could not possibly learn project management by reading PMBOK back-to-back. Instead, they should use resources that appeal to them. Simplicity would be a key requirement, and as visual as possible ... Informatic tools that allow gamification would be suitable to expand the kids' knowledge in PM ... In short, an approach that puts the weight on the practical side of project management and less in the theory, as simple and as visual as possible. (PM-09)

First, have the kids come up with their own project list. Choose the project team members with them, and then, as preparation for the training in project management techniques, in addition to basic guidance on technical aspects (scope, time, cost, quality management), go through the 20 [soft skill] items above with a slide on each item so they understand what each is and how this is important in project management. I am amazed,

delighted and uplifted by this [soft skills] list and that the profession has matured to the extent that the mathematical formulae, scientific techniques and measures we obsessed over in the 80s, 90s and early 00s have taken second place to human interaction principles. As an EI expert as applied to project management, this is something [that] brings tears to my eyes to see these things acknowledged, especially in connection with children. If kids master these principles, we will not only make project management a life skill, but they will be women and men of character, real contributors to social change. They will change the world. (PM-05)

### **Limitations**

There were some limitations observed during this research. Firstly, all participants were recruited through the Project Management Institute. Sampling project managers from other project management organisations such as APM, IPMA, and AXELOS, may have provided broader representation. Secondly, although the hard skills in this paper were represented by the ten PMBOK knowledge areas, there are other project management institutions that publish their own texts that define and emphasise hard skills in alternative ways. Future researchers should consider these texts when selecting, ranking, and reaching consensus on the important hard skills in project management. Thirdly, while this paper focused on the important components of the project management discipline in a primary school context, it did not explore how such content might be structured and delivered in the classroom. Finally, and most significantly, only the perspectives of project management practitioners were presented and discussed in this paper. To fully explore the topic of teaching project management to children in primary school, the perspectives of educators must be included.

### **Conclusion**

Project management is a technical discipline that requires a high degree of knowledge and skills. A panel of domain-specific experts was recruited to provide their perspectives on children learning project management in primary school. The results identified a list of ten hard skills and twenty soft skills in order of importance and difficulty for primary school children to learn and apply when managing projects. The panel also agreed that (i) the ideal age for children to learn project management is between 5 and 11 years old; (ii) the best place to learn project management is in a school environment; (iii) the best person to deliver the instructional content is a teacher in that school environment; and (iv) teachers ideally need training in the discipline of project management before providing explicit teaching to students.

There are several implications for both research and practice. Regarding the research community, this study represents an empirical journey to better understand how the teaching of project management can be successfully delivered into the primary school classroom. Future researchers could explore the perspectives of primary school educators, and their approaches to designing and delivering project management content for their students. For the project management discipline, children who learn the important hard and soft skills needed to successfully manage a project should become better project managers and team members as they enter the workforce. A cooperative effort between

educators, project management practitioners, and the research community, is required to provide primary school children with the best chance of learning this critical 21st century skill.

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## Appendix A: Table A1

Full demographic profile and participation of each panel member						
ID	Country	Gender	Education	Experience (yrs)	Participation	
					Round 2	Round 3
PM-01	Australia	M	Bachelor	12	Yes	Yes
PM-02	Italy	M	Bachelor	35	Yes	Yes
PM-03	Canada	M	Masters	25	Yes	Yes
PM-04	Canada	M	Masters	17	Yes	Yes
PM-05	Canada	M	Undergrad.	30	Yes	Yes
PM-06	Australia	M	Masters	30	Yes	Yes
PM-07	Czech Rep.	F	Masters	20	Yes	Yes
PM-08	United States	F	Bachelor	15	Yes	Yes
PM-09	Netherlands	M	PhD	12	Yes	Yes
PM-10	India	M	Masters	14	No	No
PM-11	Canada	M	Bachelor	25	Yes	Yes
PM-12	United States	M	Masters	20	Yes	Yes
PM-13	Portugal	F	Masters	30	Yes	Yes
PM-14	United States	M	Masters	38	No	No
PM-15	India	M	Masters	31	Yes	No
PM-16	United States	M	Bachelor	10	Yes	Yes
PM-17	Australia	M	Masters	15	Yes	Yes

## Appendix B: Table B1

Reasons for top 5 knowledge areas selected					
ID	1	2	3	4	5
PM -01	<i>Stakeholder</i> Unless you are successful in your key stakeholders' minds, every other measurement doesn't matter.	<i>Risk</i> Without risk management, you don't have a standard reasoning framework to explain why you think you may not hit the contractual milestone.	<i>Schedule</i> Everyone wants to know 'when'. The key planning tool to communicate to stakeholders is the schedule on when key items are occurring, how they may be linked to others and what might be the impact be of a delay.	<i>Scope</i> Projects are defined as a temporary formation of an organisation to get an outcome that effectively is not achievable in BAU. Scope provides a key measure of whether you have delivered against project goals.	<i>Quality</i> Quality provides a measure of whether your deliverables are of a standard that is acceptable to your stakeholder.
PM -02	<i>Communications</i> Poor, discontinuous and undifferentiated communication is the main cause of project failures.	<i>Risk</i> Risks (and opportunities) are frequently ignored, underestimated and managed in reactive/not proactive ways.	<i>Integration</i> Integration contains some essential processes such as Develop Project Charter and Integrated Change Control.	<i>Stakeholder</i> As well as for communication, effective stakeholder management is a critical success factor in most projects.	<i>Scope</i> Whatever the project complexity, scope management covers everything related to the "what" and the "how".
PM -03	<i>Stakeholder</i> Projects involve people and even if you deliver what was promised, if the stakeholders aren't happy your project was a failure.	<i>Resource</i> You can have a great project vision and an ideal solution approach but without resources (material, equipment and people) you can't deliver anything.	<i>Communications</i> 90+% of our time as PMs is spent communicating and this is often ranked as a key cause of project failures.	<i>Scope</i> Poor requirements and scope management is a leading cause of schedule delays, cost overruns, stakeholder dissatisfaction and failed projects.	<i>Quality</i> Quality is meeting all necessary requirements - those both explicitly and implicitly stated. It is not possible to achieve a project's outcomes without a focus on quality.
PM -04	<i>Integration</i> Integration Management is key as many processes interact with each other.	<i>Risk</i> Risk ties to cost, schedule and quality.	<i>Stakeholder</i> Stakeholders management and engagement is key and could affect the project drastically if not managed properly.	<i>Communications</i> Communications management is key and could affect the project drastically if not managed properly.	<i>Scope</i> Scope is important as it affects all other KA's, especially cost and schedule, that's why it is ranked higher.
PM -05	<i>Communications</i> A PM is primarily a communicator.	<i>Scope</i> Scope management is of vital importance, though it could be said that scope, cost and schedule are of equal importance with client. Flexibility in one or two of these being determinants.	<i>Stakeholder</i> See previous response.	<i>Cost</i> See previous response.	<i>Schedule</i> PMs must be able to anticipate, plan, communicate and manage risks to scope, schedule and budget to succeed

Reasons for top 5 knowledge areas selected					
ID	1	2	3	4	5
PM-06	<i>Stakeholder</i> Need support from others to succeed.	<i>Communications</i> Need to keep everyone in the loop.	<i>Risk</i> Need to anticipate and solve problems.	<i>Resource</i> Need to manage money/people.	<i>Scope</i> Need to focus on scope.
PM-07	<i>Stakeholder</i> Stakeholder management is crucial for any project. Success of the project is not the deliverable itself, but sustainability of the change, acceptance of the change and materialisation of benefits of the change. In all of this, stakeholders play a crucial role.	<i>Communications</i> Communication management is the key for efficient team working and also interaction of the project team with its surroundings. If we want people to follow one direction, and make the best decisions for the project, we need to focus on having everyone on the same page.	<i>Risk</i> Being risk aware and making proactive actions significantly increases the probability of success for the whole project.	<i>Scope</i> I see this as result of good stakeholder and risk management. Scope management is very important but should not overweigh focus on the whole purpose of the project, which comes from stakeholder management.	<i>Quality</i> I see this area as the one which determines how we manage costs, resources, and deliver the scope in the best way possible.
PM-08	<i>Communications</i> I feel communication management affects many of the other areas directly. We need to manage communication properly to gather and manage scope, risk, stakeholders (of course), costs, schedules, procurement and resources.	<i>Scope</i> Managing the scope means managing what we deliver as a project. If the scope isn't set and managed properly for a project or a sprint, then how will you know what the end is?	<i>Risk</i> Risk is near and dear to my heart. Being able to identify and manage risks properly could mean the project succeeds or crashes and burns. This takes a lot of forethought and looking at the big picture with many scenarios.	<i>Stakeholder</i> If your stakeholders are not happy, how can a project succeed? We need our stakeholders to provide us information and to approve our project (depending on the stakeholder of course).	<i>Quality</i> Quality means not only does the end product perform but it also meets the stakeholders needs. If the quality was not properly managed and has suffered, the project may fail.
PM-09	<i>Stakeholder</i> Failing to identify important stakeholders leads to longer lead times, increased costs and likely impacts the quality of the overall outcome. The delivery of a successful project depends largely on selecting the right project stakeholders.	<i>Communications</i> A PM communicates about 80% of the time. Communication management is therefore key.	<i>Scope</i> The next three choices have to do with the typical project triple constraint: scope, schedule and cost. Scope is the most important of the three, since it is the one that is more tempting to "creep" by certain stakeholders.	<i>Schedule</i> Schedule management comes next. Typically, we work against deadlines. Budget is important, but it tends to offer more flexibility.	<i>Cost</i> Thus, budget management comes after scope and schedule management.

Reasons for top 5 knowledge areas selected					
ID	1	2	3	4	5
PM -10	<i>Scope</i> Correctly defined scope is the base for any project lifecycle. Any changes or scope creep is going to have a direct impact on the project deliverables (schedule, cost, quality).	<i>Communications</i> Project manager spend 90% of their time communicating with stakeholders. Clear and transparent communication always keeps stakeholders engaged.	<i>Stakeholder</i> Project is about change and for any change, the people side is very important.	<i>Schedule</i> Time has a direct impact on the business case of the project. For example, a delay in the launch of a new product is an opportunity for competitors.	<i>Risk</i> The early identification of threats and opportunities helps to increase the chances of a successful project.
PM -11	<i>Communications</i> Important for transparency; facilitates buy-in; keeps everyone informed.	<i>Integration</i> Gives you the big picture.	<i>Cost</i> Economy and cost control are important.	<i>Risk</i> Risk can impact cost, and cause failure to the project.	<i>Stakeholder</i> Getting everyone on board.
PM -12	<i>Communications</i> Communication is key. I've seen many projects fail due to poor communication. If you can't communicate, nothing else will get done.	<i>Stakeholder</i> I've had stakeholders end in-flight projects, resulting in millions of dollars of sunk costs.	<i>Integration</i> Integration pulls all other plans together.	<i>Scope</i> Need to understand "Done" from a scope standpoint; decisions can be made against that.	<i>Risk</i> Risks are everywhere! Not managed, they can grow out of proportion.
PM -13	<i>Integration</i> The first priority and focus of a PM is to balance the difference areas.	<i>Stakeholder</i> Managing stakeholders from their identification to strategies and implementation is key for success, as projects exist from people to people.	<i>Communications</i> Communication is a critical tool for success with stakeholders (including team and suppliers), especially if you consider that in today's global world, we have mostly virtual and multi-cultural projects.	<i>Risk</i> Risk identification and strategies to deal/mitigate issues with stakeholders and triple constraints.	<i>Procurement</i> Procurement is important, especially with stakeholder, but also regarding ethics and compliance to local regulations.
PM -14	<i>Integration</i> Knowing how pieces interact.	<i>Stakeholder</i> Keep the business champions engaged.	<i>Communications</i> Provide information up and down the value stream.	<i>Schedule</i> People want to know when things are going to happen.	<i>Scope</i> Make objectives obtainable.

Reasons for top 5 knowledge areas selected					
ID	1	2	3	4	5
PM -15	<i>Communications</i> I believe that effective communication (listening, speaking, writing, observing body language, gestures, etc.) is the most critical of all knowledge areas for project success.	<i>Stakeholder</i> Project success can be made or broken by people. It is vital to understand stakeholder expectations, risk tolerances, and dynamics between competing needs. To ensure success, PMs need to engage stakeholders throughout the project.	<i>Resource</i> To achieve success, PMs need to work hard to achieve an optimum combination of resources. In knowledge industries, there needs to be higher focus on human resources.	<i>Schedule</i> Today's competitive marketplaces require a "quick to market" mentality. As such, effective management of the project schedule deserves a place in the top five.	<i>Scope</i> Fuzzy requirements and scope creep were among the top 20 global failure factors in a research poll I carried out when writing my book. Hence, I added this knowledge area to my top five.
PM -16	<i>Communications</i> Communication is the basis of everything else.	<i>Stakeholder</i> Understanding the needs and intents of stakeholders, while keeping concise and open lines of communication, forges partnerships, trust, and enables opportunities to influence.	<i>Risk</i> Keeping tabs on identification, tracking, and ownership of risks is vitally important to maintaining a long-term, strategic view.	<i>Integration</i> Coordinated and organised oversight keeps the project wheels turning smoothly.	<i>Scope</i> So easy for scope to creep past the original intent. While we can recognise identification of future needs as the team learns more, it is with thoughtful scope management and prioritisation that the project delivers on its original intent.
PM -17	<i>Scope</i> Scope must be very clear and precise to eliminate issues of misinterpretation.	<i>Integration</i> It is the backbone of the entire project.	<i>Cost</i> Costing is the main part of the project to be executed.	<i>Schedule</i> Utilisation of resources and the timeframe of executing.	<i>Resource</i> Availability of resources.

*Note.* Some responses have been edited to correct grammar and improve clarity. Use web reader or PDF reader 'zoom in' function if necessary for improved readability.

## Appendix C: Table C1

List of 70 soft skills and those nominated as most important					
Soft skill	f	Soft skill	f	Soft skill	f
Communication	14	Time management	5	Issue management	2
Leadership	11	Work ethic	5	Managing people	2
Negotiation	11	Respectful	5	Kindness	2
Emotional intelligence	11	Servant leadership	5	Open mindedness	1
Problem solving	10	Team building	4	Presentation	1
Influencing	10	Coaching	4	Detail focused	1
Conflict management	10	Self-confidence	4	Approachable	1
Listening	9	Fairness	4	Forecasting	1
Adaptability	9	Accountability	4	Humbleness	1
Facilitation	9	Political awareness	4	Relationship capital	1
Cultural sensitivity	9	Patience	4	Tough conversations	1
Teamwork	8	Relationship building	4	Simplicity	1
Resilience	8	Trustworthy	3	Citizenship	1

Decision making	8	Courage	3	Versatility	1
Critical thinking	8	Ability to learn	3	Flexibility	0
Empathy	7	Mentoring	3	Interpersonal	0
Motivation	7	Honesty	3	Artistic sensibility	0
Collaboration	7	Inspiring	3	Responsiveness	0
Creative thinking	7	Positivity	2	Autonomy	0
Integrity	7	Compassion	2	Aesthetic sensibility	0
Transparency	6	Analytical	2	Technological sensitivity	0
Persuasion	5	Calm	2	Advising	0
Organising	5	Decisiveness	2		
Social awareness	5	Responsible	2		

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