Future Problem Solving Program International: Catalyst for Talent Recognition and Development

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FUTURE PROBLEM SOLVING PROGRAM *International*

Program Components:

➤ *Global Issues Problem Solving*

➤ *Community Problem Solving (CmPS)*

➤ *Action-based Problem Solving (AbPS)*

➤ *Scenario Writing*

FPS Students of the 21st Century are:

★ **Globally Aware**

★ **Futuristic Thinkers**

★ **Effective Problem Solvers**

★ **Collaborative Team Members**

★ **Diverse Thinkers**

★ **Analytical Researchers**

★ **Resourceful & Innovative**

"The genius of the future will be the creative mind adapting itself to the shape of things to come."

E. Paul Torrance
Creativity, (1991)

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The Future Problem Solving Program International (FPSPI) offers students of many ages a variety of opportunities to learn and apply thinking and problem solving skills that they will need for success throughout life. In a recent international program evaluation report (Treffinger, Selby, & Crumel, 2011, pp. 18, 134-135) many respondents also recognized the important contributions FPSPI makes to meeting the unique needs of high-ability students. FPSPI's components provide:

- opportunities for engagement and interaction among high-ability, like-minded people and to meet others who love the challenges of problem solving;
- affirmation that "it is all right to be smart and creative;"
- opportunities for academically talented students to "see others like themselves achieving great things."

The purposes of this paper are to summarize the relationships among creativity, problem solving, and talent development and clarify the important ways in which FPSPI applies and synthesizes those essential dimensions through its programs and activities.

Relationships among creativity, problem solving, and talent development

Creativity, giftedness, and talent are all terms for which there are many definitions. The relations among the three constructs have also been described in a variety of ways, and our understanding of all three constructs has evolved and expanded over time.

There are more than 100 published definitions of creativity involving cognitive abilities, personality characteristics, social and interpersonal factors, product or outcome dimensions, or the interactions among those factors (Treffinger, 2011). It is widely recognized that creativity is multi-faceted, although the most common elements among creativity definitions are an emphasis on novelty or originality and usefulness. As our understanding of creativity has grown, beyond early conceptions that treated it as a rare kind of genius akin to madness, creativity has become better understood as a natural, healthy constructive capability (e.g. Isaksen, Dorval, & Treffinger, 2011) that is present to some degree in all people and can be nurtured or enhanced through deliberate educational efforts or training.

Many scholars also view creativity and problem solving as closely intertwined. Sternberg (2004, pp. 256-258), for example, proposes that the components of creativity involve problem redefinition, problem analysis, selling a solution, recognizing how knowledge can both help and hinder creative thinking, willingness to take sensible risks, willingness to surmount obstacles, belief in one's ability to accomplish the task at hand, willingness to tolerate ambiguity, and willingness to find extrinsic rewards for the things one is intrinsically motivated to do. Isaksen, Dorval, & Treffinger (2011) proposed that effective problem solving involves both generating options (creative thinking) and focusing options (critical thinking).

Our conceptions of giftedness and talent have also evolved and expanded in a variety of ways. Psychologists and educators once viewed giftedness primarily as an exceptional level of performance on a specific test (such as an IQ test) that measures a unitary, general "intelligence" factor. Over the years, and through the theoretical and research contributions of many scholars,

including Howard Gardner, J. P. Guilford, Joseph Renzulli, Robert Sternberg, and Calvin Taylor, our prevailing conception of intelligence, giftedness, and talent has broadened to recognize that there are many and varied abilities and that "gifts" can differ widely among people and be expressed and applied in many important ways.

Early views of "talent" focused for some only on artistic pursuits, for others on performance in a specific domain (often in a specific, non-academic domain, such as a "talented" athlete, architect, or carpenter, for example), or even for others as a level of performance on an IQ or ability test that was above average, but not high enough to be considered "gifted." As our conceptions of intelligence and giftedness broadened, the distinctions between "gifts" and "talents" have blurred considerably, and there has been considerable overlap between the two concepts.

Our expanding conceptions of creativity, giftedness, and talent have also brought into clearer view the important interrelationships among all three constructs. Renzulli (1978), for example, defined giftedness as an interaction of above average ability, creativity, and task commitment. Guilford's *Structure of Intellect* Model, Taylor's *multiple talents,* Gardner's *multiple intelligences,* and other models have highlighted both the broad array of important human abilities and the importance of being able to apply or use what one knows to solve problems, formulate innovative products and processes, and manage complexity and change— beyond merely amassing and reciting isolated bits of information. Lubart, Georgsdottir, and Besançon (2009, p. 46) observed that "for more than 40 years, creativity has generally been considered an important component of high potential and talent." Sternberg (2004, p. 255) summarized this view effectively: "Giftedness is, in large part, a function of creativity in generating ideas, analytical intelligence in evaluating the quality of these ideas, practical intelligence in implementing the ideas and convincing others to value and follow the ideas, and wisdom to ensure that the decisions and their implementation is for the common good of all stakeholders."

E. Paul Torrance, founder of FPSPI, was also among the early pioneers in research on creativity in education. A man of considerable vision and commitment to children and youth, Torrance advocated for a conception of giftedness that extended beyond the traditionally narrow, psychometrically restricted definitions of giftedness that focused heavily on IQ scores. He was a particularly strong advocate of the view that creativity should play a significant role in any broadened or expanded conception of giftedness. From the early 1960s, Torrance argued for attention to "creative giftedness" (see Torrance, 1995, pp. 5-19). The following statement summarized succinctly but effectively Torrance's decades-long, pioneering commitment to a broadened understanding of giftedness, "There are many kinds of creativity and many kinds of talent. The world needs all of them…." (1994, p. 234).

Recognizing and nurturing students' strengths and talents: FPSPI's role

Torrance noted that FPS emerged in the 1970s from the fact that he and his wife, Pansy, "sensed a need for creatively gifted youngsters to develop richer images of the future and to expand their creativity" (Torrance, 1994, p. 33). From the beginnings of the program, Torrance held that "students currently in differentiated programs for the gifted like to think about the future, and believe that there is much that they can do to change it, and to shape it. However, many are

doubtful of the influence their actions will have, and believe that examples from the past are the best guides to the future" (1978, p. 75). Skills in FPS that Torrance considered "uniquely fitted to the needs and characteristics of gifted and talented students" (p.77) included: problem-solving skills (where he found that gifted students typically lagged behind others), improvement of teamwork skills, enlarging and enriching images of the future, and interdisciplinary skills.

In 1982, Torrance described ten "lessons" about developing gifts and talents that he learned during a period of extended observation and study in Japanese schools. In many ways, those lessons are equally important for gifted programming and talent development in schools today, and they are represented in the FPSPI program today as well; they are:

1. National commitment to full potential ("full development of the creative potential of each person and to the importance of the creativity of each individual")
2. No ceiling on excellence
3. Importance of the arts in the pre-school years
4. Any child may be gifted and talented
5. Materials for young children and their parents
6. Training in group or team creativity
7. Fantasy, persistence, and other creative characteristics
8. Search for ideas from afar
9. Self-directed learning
10. The "long look"—images of the future

Given the long history of the interrelationships among creativity, problem solving, and talent development, as well as expanded conceptions of giftedness in contemporary theory and research, it is clear that FPSPI can make valuable contributions for education today, just as it has done for four decades. As learners discover and develop their talents, they will also need support in learning how to deal effectively with rapid change and the uncertainty of the future (Treffinger, Nassab, & Selby, 2004, p. 211).

Rogalla (2003) described a number of ways in which FPSPI contributes to the education of the gifted and talented. The high level of challenge offered by FPSPI was viewed by Rogalla as especially important for intellectually and creatively gifted students, noting that the program offers enrichment opportunities that can be incorporated in a variety of gifted program service delivery models, including pull-out programs, resource center models, after-school programs, or even in the regular classroom setting. Rogalla concluded:

> Future Problem Solving takes students into new worlds. They gain new knowledge about cutting-edge research and use it in combination with higher order thinking to create original solutions for futuristic problems. Most gifted students love this kind of intellectual challenge. Seeing Community Problem Solvers grapple with real life problems and grow in their awareness of their capability to have a positive impact on the world around them is also gratifying to educators. The most obvious effect of Scenario Writing is improved writing skills. However, all FPSP components help students develop their written and oral communication skills. Improved communication skills and a thorough

understanding of the six-step problem-solving model can greatly benefit the students far beyond the program (e.g., in other curricular activities and in their future careers).

Creative thinking, critical thinking, problem-solving, and developing what Torrance described as "the long look" at the future continue to be described as fundamental goals for gifted and talented programming across many gifted programming models and approaches. Among the contemporary models incorporating the importance of thinking and problem-solving skills are: the Autonomous Learner Model, the DISCOVER model, the Purdue Three Stage Model, the Schoolwide Enrichment Model, the Levels of Service approach, and the Parallel Curriculum Model; for more information about these and other models, see Renzulli, Gubbins, McMillen, Eckert, & Little (2009). Contemporary models for talent development programming have also moved from a single, fixed program to a more extensive array of services that address the strengths, talents, and sustained interests of students in a variety of ways. Differentiation of instruction, which once implied a single gifted program that was "qualitatively different" from the regular school program, has expanded to challenge educators to recognize and respond appropriately to learner characteristics in a variety of ways. Differentiated instruction has also been highlighted as an important and valuable set of tools for all educators (e.g., Tomlinson, 2004).

All FPSPI components address an important common set of goals and purposes involving creativity, problem solving, teamwork and collaboration, and concern for the future. However, each program component also adds educational value in unique ways. The Global Issues Problem Solving component (GIPS), for example, provides opportunities for academically able students to apply their research and analytical skills. The Scenario Writing (SW) component, for example, models talent development opportunities that we want students to have, and engages them in real-world application of their own strengths, interests, and passion for writing. It allows students to opt-in based on their own interests without having to have been formally identified as "gifted" writers. The Community Problem Solving (CmPS) component provides students with opportunities for action-oriented creative problem solving that is linked directly to community service. The development of individual as well as team participation opportunities enables students with varied styles of learning and working to engage in the program in personally rewarding ways.

In many ways, then, both major elements of Torrance's initial vision for FPS continue today to hold value for education: responding to the characteristics and needs of high-ability students (defined in relation to academic or intellectual giftedness), *and* responding in varied ways to the creative strengths and talents of students across a variety of domains (defined in relation to broader conceptions of giftedness and talent). FPSPI provides a vehicle for *all s*tudents to express and apply creative strengths and talents in many ways. As Cramond (2009) argued:

> All students must learn how to find problems, generate solutions, evaluate them, sell their solutions to others, and implement them. They must learn how to work on teams as well as independently. They should all learn to be involved in their communities and how they can make a difference. Most importantly, they must learn how to learn, and they must learn about the tentative nature of knowledge. (p. 1150).

Viewed from a broader perspective— cutting across definitions, theories, and models of creativity, giftedness, and talent development— the National Association for Gifted Children (2010) has formulated a comprehensive set of programming standards. These standards provide a foundation for policy and systematic program development that can be implemented through a variety of models or approaches. Extensively grounded in research, theory, and exemplary school practice, and having involved over more than a decade of review and collaborative evaluation, the NAGC programming standards guide educators at all levels in establishing and improving services for high-ability learners.

A review of these standards reveals that FPSPI can be a valuable programming resource for responding to key student outcomes and evidence-based practices in four of the six standards. Tables 1-4 (on the following pages) summarize the relevant elements of those four standards and the ways in which FPSPI supports them.

Summary: Four Key Messages

1. For more than three decades, FPSPI has been committed to providing engaging opportunities for developing skills that are essential for academically or intellectually gifted students, including creativity, problem-solving, teamwork and collaboration, and a futuristic outlook with a global perspective.

2. At the same time, FPSPI provides challenging and important opportunities for students who are talented in many areas other than IQ or academic ability, and for motivated students across many ability levels and social or cultural contexts, to learn and apply creativity, problem-solving, teamwork and collaboration skills.

3. As our understanding of students' gifts and talents has broadened over the program's history, expanded FPSPI components (e.g., Community Problem Solving and Scenario Writing, and the development of both team and individual components) have emerged to provide varied challenges for students. While all program components share some common goals and purposes, each component offers unique opportunities for certain students.

4. FPSPI provides valuable opportunities to help educators in the classroom, in the school, or at a broader level of participation, to meet established standards for effective programming for all students as well as for students with many gifts and talents. FPSPI contributes to excellence in education in many ways.

Table 1: Linking FPSPI to NAGC Programming Standard One

STANDARD 1: LEARNING AND DEVELOPMENT. *Educators, recognizing the learning and developmental differences of students with gifts and talents, promote ongoing self-understanding, awareness of their needs, and cognitive and affective growth of these students in school, home, and community settings to ensure specific student outcomes.*

STUDENT OUTCOMES	EVIDENCE-BASED PRACTICES
1.1. Self-Understanding. Students with gifts and talents demonstrate self-knowledge with respect to their interests, strengths, identities, and needs in socio-emotional development and in intellectual, academic, creative, leadership, and artistic domains.	1.1.1. Educators engage students with gifts and talents in identifying interests, strengths, and gifts. 1.1.2. Educators assist students with gifts and talents in developing identities supportive of achievement.
1.2. Self-Understanding. Students with gifts and talents possess a developmentally appropriate understanding of how they learn and grow; they recognize the influences of their beliefs, traditions, and values on their learning and behavior.	1.2.1. Educators develop activities that match each student's developmental level and culture-based learning needs.
1.3. Self-Understanding. Students with gifts and talents demonstrate understanding of and respect for similarities and differences between themselves and their peer group and others in the general population.	1.3.1. Educators provide a variety of research-based grouping practices for students with gifts and talents that allow them to interact with individuals of various gifts, talents, abilities, and strengths. 1.3.2. Educators model respect for individuals with diverse abilities, strengths, and goals.
1.4. Awareness of Needs. Students with gifts and talents access resources from the community to support cognitive and affective needs, including social interactions with others having similar interests and abilities or experiences, including same-age peers and mentors or experts.	1.4.1. Educators provide role models (e.g., through mentors, bibliotherapy) for students with gifts and talents that match their abilities and interests. 1.4.2. Educators identify out-of-school learning opportunities that match students' abilities and interests.
1.7. Cognitive and Affective Growth. Students with gifts and talents recognize their preferred approaches to learning and expand their repertoire.	1.7.1 Teachers enable students to identify their preferred approaches to learning, accommodate these preferences, and expand them.

Student Outcomes and Evidence-based Practices excerpted from NAGC (2010), p. 8

HOW FPSPI SUPPORTS THIS STANDARD

The FPSPI GIPS and CmPS components offer students opportunities to identify their strengths and to apply those strengths to support their team's efforts. Students on FPSPI teams are expected to learn to function effectively on their own under competitive circumstances, which challenges them to become aware of and to make use of each person's strengths to contribute to the team's overall success. Both GIPS and CmPS also provide many opportunities for students to demonstrate leadership on their team— with various team members providing leadership for specific tasks. In CmPS, for example, students are asked to define the assignments and responsibilities assigned to each team member, and to assess their own effectiveness in carrying out their tasks. Effective GIPS and CmPS teams learn and apply skills that involve social and interpersonal competence as well as academic knowledge and skills. In addition, the students' choice of team or individual participation in GIPS or CmPS enables them to recognize their preferred approach and to make choices and decisions based on that awareness. Scenario Writing provides opportunities for students with high interest and talent in writing to apply those skills to future-oriented problems and challenges. As students involved in FPSPI engage in competitions beyond the local level to the international level, they meet, interact with, and exchange ideas with a diverse array of other students from other settings and cultures.

Table 2: Linking FPSPI to NAGC Programming Standard Three

STANDARD 3: CURRICULUM PLANNING AND INSTRUCTION. *Educators apply the theory and research-based models of curriculum and instruction related to students with gifts and talents and respond to their needs by planning, selecting, adapting, and creating culturally relevant curriculum and by using a repertoire of evidence-based instructional strategies to ensure specific student outcomes.*	

STUDENT OUTCOMES	EVIDENCE-BASED PRACTICES
3.1. Curriculum Planning. Students with gifts and talents demonstrate growth commensurate with aptitude during the school year.	3.1.4. Educators design differentiated curricula that incorporate advanced, conceptually challenging, in-depth, distinctive, and complex content for students with gifts and talents.
3.2. Talent Development. Students with gifts and talents become more competent in multiple talent areas and across dimensions of learning.	3.2.1. Educators design curricula in cognitive, affective, aesthetic, social, and leadership domains that are challenging and effective for students with gifts and talents. 3.2.2. Educators use metacognitive models to meet the needs of students with gifts and talents.
3.3. Talent Development. Students with gifts and talents develop their abilities in their domain of talent and/or area of interest.	3.3.1. Educators select, adapt, and use a repertoire of instructional strategies and materials that differentiate for students with gifts and talents and that respond to diversity. 3.3.2. Educators use school and community resources that support differentiation. 3.3.3. Educators provide opportunities for students with gifts and talents to explore, develop, or research their areas of interest and/or talent.
3.4. Instructional Strategies. Students with gifts and talents become independent investigators.	3.4.1. Educators use critical-thinking strategies to meet the needs of students with gifts and talents. 3.4.2. Educators use creative-thinking strategies to meet the needs of students with gifts and talents. 3.4.3. Educators use problem-solving model strategies to meet the needs of students with gifts and talents. 3.4.4. Educators use inquiry models to meet the needs of students with gifts and talents.
3.5. Culturally Relevant Curriculum. Students with gifts and talents develop knowledge and skills for living and being productive in a multicultural, diverse, and global society.	3.5.1. Educators develop and use challenging, culturally responsive curriculum to engage all students with gifts and talents. 3.5.3. Educators use curriculum for deep explorations of cultures, languages, and social issues related to diversity.
3.6. Resources. Students with gifts and talents benefit from gifted education programming that provides a variety of high quality resources and materials	3.6.1. Teachers and administrators demonstrate familiarity with sources for high quality resources and materials that are appropriate for learners with gifts and talents.

Student Outcomes and Evidence-based Practices excerpted from NAGC (2010), p. 10

HOW FPSPI SUPPORTS THIS STANDARD
Every component of FPSPI engages students in learning and applying skills and tools for creative thinking, critical thinking, and problem solving. The GIPS and Scenario Writing components engage students in conducting research to help them understand complex, future-oriented problems and challenges on a variety of topics and themes and in thinking about the global implications and consequences of those problems. In CmPS, students must use a variety of resource materials, people, and groups to understand community-based problems and their implications for many members of the community. Students explore, research and solve complex problems with the ultimate goal of creation of a sustainable action plan. In all FPSPI components, as students move from their local program to engaging in competition at higher levels (and eventually to the International Competition), they also have many opportunities to meet, interact, and share with other students from diverse backgrounds and cultural contexts.

Table 3: Linking FPSPI to NAGC Programming Standard Four

STANDARD 4: LEARNING ENVIRONMENTS. *Learning environments foster personal and social responsibility, multicultural competence, and interpersonal and technical communication skills for leadership in the 21st century to ensure specific student outcomes.*

STUDENT OUTCOMES	EVIDENCE-BASED PRACTICES
4.1. *Personal Competence.* Students with gifts and talents demonstrate growth in personal competence and dispositions for exceptional academic and creative productivity. These include self-awareness, self-advocacy, self-efficacy, confidence, motivation, resilience, independence, curiosity, and risk taking.	4.1.1. Educators maintain high expectations for all students with gifts and talents as evidenced in meaningful and challenging activities. 4.1.2. Educators provide opportunities for self-exploration, development and pursuit of interests, and development of identities supportive of achievement, e.g., through mentors and role models. 4.1.3. Educators create environments that support trust among diverse learners. 4.1.4. Educators provide feedback that focuses on effort, on evidence of potential to meet high standards, and on mistakes as learning opportunities. 4.1.5. Educators provide examples of positive coping skills and opportunities to apply them.
4.2. *Social Competence.* Students with gifts and talents develop social competence manifested in positive peer relationships and social interactions.	4.2.1. Educators understand the needs of students with gifts and talents for both solitude and social interaction. 4.2.2. Educators provide opportunities for interaction with intellectual and artistic/creative peers as well as with chronological-age peers. 4.2.3. Educators assess and provide instruction on social skills needed for school, community, and the world of work.
4.3. *Leadership.* Students with gifts and talents demonstrate personal and social responsibility and leadership skills.	4.3.1. Educators establish a safe and welcoming climate for addressing social issues and developing personal responsibility. 4.3.2. Educators provide environments for developing many forms of leadership and leadership skills. 4.3.3. Educators promote opportunities for leadership in community settings to effect positive change.
4.4. *Cultural Competence.* Students with gifts and talents value their own and others' language, heritage, and circumstance. They possess skills in communicating, teaming, and collaborating with diverse individuals and across diverse group. They use positive strategies to address social issues, including discrimination and stereotyping.	4.4.1. Educators model appreciation for and sensitivity to students' diverse backgrounds and languages. 4.4.2. Educators censure discriminatory language and behavior and model appropriate strategies. 4.4.3. Educators provide structured opportunities to collaborate with diverse peers on a common goal.
4.5. *Communication Competence.* Students with gifts and talents develop competence in interpersonal and technical communication skills. They demonstrate advanced oral and written skills, balanced biliteracy or multiliteracy, and creative expression. They display fluency with technologies that support effective communication.	4.5.1. Educators provide opportunities for advanced development and maintenance of first and second language(s). 4.5.2. Educators provide resources to enhance oral, written, and artistic forms of communication, recognizing students' cultural context. 4.5.3. Educators ensure access to advanced communication tools, including assistive technologies, and use of these tools for expressing higher-level thinking and creative productivity.

Student Outcomes and Evidence-based Practices excerpted from NAGC (2010), p. 11

HOW FPSPI SUPPORTS THIS STANDARD.
FPSPI provides, in all its components, opportunities for students to interact and form positive relationships with others who share their interests, curiosity, and creative energy. FPSPI gives students numerous opportunities to work with their academic and creative peers, and for like-minded students to collaborate, to recognize each other's strengths, and to celebrate their accomplishments. Participation in FPSPI also provides a variety of leadership development opportunities for students. Through participation in FPSPI, students also have many and varied opportunities to apply and share their communication skills in a variety of ways. Students involved in CmPS, for example, share their work through displays, multi-media presentations, and oral communication with other students as well as with a variety of adults (in their school, in the community, and through competitions from the local to the international levels) with other participating students, evaluators, and visitors. In all program components, experienced participants mentor those with less experience.

Table 4: Linking FPSPI to NAGC Programming Standard Five

STANDARD 5: PROGRAMMING	
Description: *Educators are aware of empirical evidence regarding (a) the cognitive, creative, and affective development of learners with gifts and talents, and (b) programming that meets their concomitant needs. Educators use this expertise systematically and collaboratively to develop, implement, and effectively manage comprehensive services for students with a variety of gifts and talents to ensure specific student outcomes.*	
STUDENT OUTCOMES	**EVIDENCE-BASED PRACTICES**
5.1. Variety of Programming. Students with gifts and talents participate in a variety of evidence-based programming options that enhance performance in cognitive and affective areas.	5.1.2. Educators regularly use enrichment options to extend and deepen learning opportunities within and outside of the school setting. 5.1.6. Administrators demonstrate support for gifted programs through equitable allocation of resources and demonstrated willingness to ensure that learners with gifts and talents receive appropriate educational services.
5.3. Collaboration. Students with gifts and talents' learning is enhanced by regular collaboration among families, community, and the school.	5.3.1. Educators regularly engage families and community members for planning, programming, evaluating, and advocating.
5.5. Comprehensiveness. Students with gifts and talents develop their potential through comprehensive, aligned programming and services.	5.5.1. Educators develop thoughtful, multi-year program plans in relevant student talent areas, PK-12.
5.6. Policies and Procedures. Students with gifts and talents participate in regular and gifted education programs that are guided by clear policies and procedures that provide for their advanced learning needs (e.g., early entrance, acceleration, credit in lieu of enrollment).	5.6.1. Educators create policies and procedures to guide and sustain all components of the program, including assessment, identification, acceleration practices, and grouping practices, that is built on an evidence-based foundation in gifted education.
Student Outcomes and Evidence-based Practices excerpted from NAGC (2010), p. 12	
HOW FPSPI SUPPORTS THIS STANDARD FPSPI provides many and varied opportunities for students to engage in learning experiences and productivity that extend beyond the regular curriculum. Students also have opportunities for their work to be evaluated in authentic ways that extend beyond standardized test performance and to receive recognition for their efforts and accomplishments that go beyond "marks" or grades on report cards; they have opportunities for their ideas and products to be compared and contrasted with the efforts of others across a wide variety of geographic and cultural contexts. In addition, through informal social interaction at FPSPI competitions, students extend their learning and its applications within and beyond the school setting. Flexibility in grouping and accelerative practices is prevalent in all FPSPI components.	

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