The Factors Promoting the Systematization of the PDCA Cycle in Student Support Systems: Special Needs Education in Japan

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Abstract
Since 2007, Japanese public schools have established student support systems. However, earlier studies have shown that coordinators—the key persons who promote these systems in schools—lack the required knowledge, skills, and time. Furthermore, they face challenges in obtaining the cooperation of teachers. Consequently, student support systems are not functioning as well as intended. Using a "PDCA cycle promoting sheet," Matsumoto (2016) showed that holding school committee meetings more regularly is an effective means of making school systems more systematic. In this study, we analyzed the same data as Matsumoto (2016) to clarify the additional factors that make student support systems more systematic. The completed sheets highlighted both the weak and strong points of student support systems from two perspectives, namely: the cycle itself and the process of sharing information. Study participants comprised 50 coordinators, 24 elementary schools, and 26 junior high school in Japan. We found significant difference in the results of the PDCA cycle promoting sheet between coordinators ensuring good cooperation and those facing difficulties in cooperation, as well as between individual and team coordinators. The results revealed that coordinator's working in a team will promote the PDCA cycle of the student support systems, while the experience as a coordinator will not. In addition to the need for the principal to show that a basic policy for special needs is one the pillars of the school management plan, we recommended that they appoint more than two coordinators in their school.

Keywords: PDCA Cycle, Special Needs Education Coordinator, Student Support System

Introduction

In 2007, the Japanese Ministry of Education, Culture, Sports, Science, and Technology issued a notice regarding the need for special needs education in the country's schools. In the decade since, all public schools have established a student support system (Ministry of Education, Culture, Sports, Science and Technology Japan, 2017b) that they now seek to enrich. As the key persons promoting this system in each school, special needs coordinators have six major tasks in addition to their regular daily teaching work. These are: a) running a school committee supporting special education, b) formulating an "Individual Education Support Plan," c) developing an "Individualized Education Plan," d) planning in-school teachers' training, e) enlightening parents about special needs education, and f) cooperating with external experts.

To make up for the coordinator's lack of knowledge and skills, each local government has been holding coordinator training and sending itinerant school consultants to each school. For example, in Suginami-Ward—located in west Tokyo—the educational committee provides a coordinators training course comprised of three levels of training for coordinators according to their experience: one year, two to four years, and more than five years (Tamura, 2012). They also have an itinerant school consultants team composed of a psychologist and retired school principal (Nakamura, 2012). However, previous studies show that coordinators lack the knowledge, skills, and time needed to serve effectively; and that they face challenges in gaining cooperation among teachers (Matsumoto 2012; Miyaki & Kifune 2011). Consequently, student support systems are not functioning as well as intended.

Even if the coordinator works effectively, support for children with special needs might be cut off when a coordinator transfers or retires. As such, the student support system must function systematically, without depending on the ability of the individual coordinator. Accordingly, the leadership of the school principals is most necessary. They must provide a basic policy for special needs education as one of the pillars of the school management plan (school management policies) (Ministry of Education, Culture, Sports, Science and Technology Japan, 2017a) to actualize a whole school approach to the student support system.

In 96% of public schools in Japan, school management is based on the Plan-Do-Check-Act (PDCA) cycle (Ministry of Education, Culture, Sports, Science and Technology Japan, 2016). The PDCA cycle is a method intended to continuously improve an organization. It teaches entities to plan an action according to the research, implement it, check the results compared to the plan, and act on what has been learned. Matsumoto (2016) made a tool to aid coordinator's in improving the PDCA cycle of the student support system: a PDCA cycle promoting sheet (Figure 1).

The PDCA cycle promoting sheet comprises six questions on a coordinator's major tasks. Each question has five parts, one for each stage of the PDCA cycle: Research, Plan, Do, Check, and Act. The coordinators complete this sheet by scoring the person working on a task or with whom they are sharing information. For example: not working: 0 point (undone); the person in charge alone: 1 point; the person in charge plus other teachers: 2 points (individual level); a small group: 3 points; and the whole school: 4 points (system level). The completed PDCA Cycle Promoting Sheet

highlights both the weak and strong points of student support systems from two perspectives, namely the cycle itself and the process of sharing information.

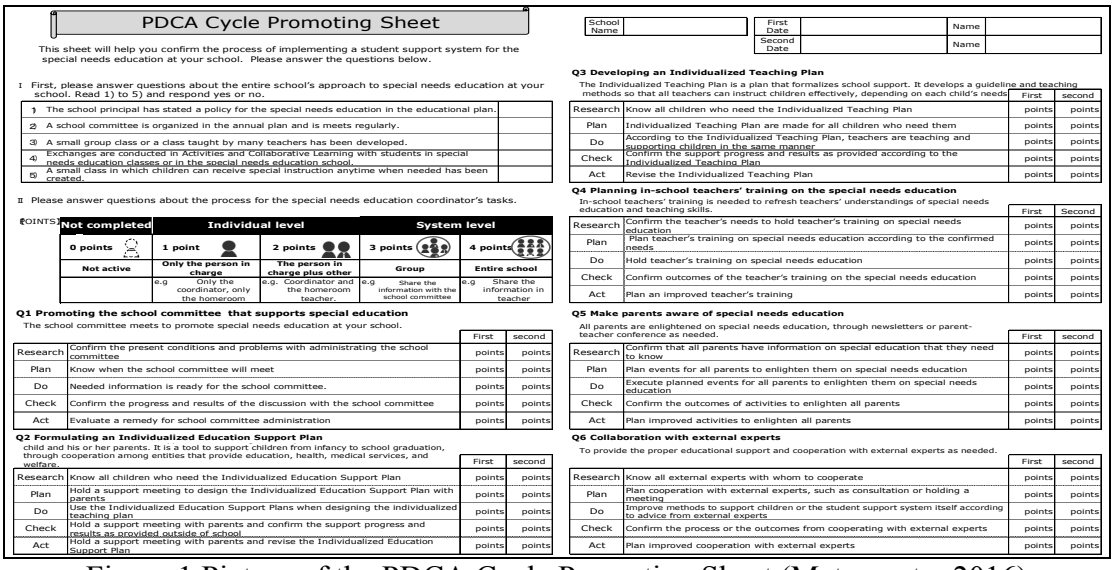
Using this PDCA cycle promoting sheet in their survey, Matsumoto (2016) concluded that holding a school committee regularly will enable student support systems to become more systematic. Tanaka and Okuzumi (2014) also reported that the regularization of the school committee deepens the teacher's understanding of special support education. However, there are no other studies evidencing what can promote the systematic management of the student support systems. In this study, we analyze the same data as Matsumoto (2016) to clarify additional factors that make student support systems more systematic.

Method

While this study used the same data as Matsumoto (2016), its analysis focused on different parts of the data. More specifically, in this study we analyzed the relationship between the results of the PDCA cycle promoting sheet and the coordinator's careers and their working environment.

Participants. The participants in this study comprised 50 coordinators, 24 elementary schools, and 26 junior high schools in Japan.

Materials. The PDCA Cycle Promoting Sheet (Matsumoto, 2016), shown in Figure 1, and a questionnaire on the profiles of the coordinators and the schools where they work.



PDCA Cycle Promoting Sheet

This sheet will help you confirm the process of implementing a student support system for the special needs education at your school. Please answer the questions below.

School Name | First Date | Second Date | Name | Name

I First, please answer questions about the entire school's approach to special needs education at your school. Read 1) to 5) and respond yes or no.

1)	The school principal has stated a policy for the special needs education in the educational plan.	
2)	A school committee is organized in the annual plan and is meets regularly.	
3)	A small group class or a class taught by many teachers has been developed.	
4)	Exchanges are conducted in Activities and Collaborative Learning with students in special needs education classes or in the special needs education school.	
5)	A small class in which children can receive special instruction anytime when needed has been created.	

II Please answer questions about the process for the special needs education coordinator's tasks.

POINTS:	Not completed	Individual level		System level	
	0 points	1 point	2 points	3 points	4 points
	Not active	Only the person in charge	The person in charge plus other	Group	Entire school
		e.g Only the coordinator, only the homeroom	e.g. Coordinator and the homeroom teacher.	e.g Share the information with the school committee	e.g Share the information in teacher

Q1 Promoting the school committee that supports special education
The school committee meets to promote special needs education at your school.

		First	second
Research	Confirm the present conditions and problems with administrating the school committee	points	points
Plan	Know when the school committee will meet	points	points
Do	Needed information is ready for the school committee.	points	points
Check	Confirm the progress and results of the discussion with the school committee	points	points
Act	Evaluate a remedy for school committee administration	points	points

Q2 Formulating an Individualized Education Support Plan
child and his or her parents. It is a tool to support children from infancy to school graduation, through cooperation among entities that provide education, health, medical services, and welfare.

		First	second
Research	Know all children who need the Individualized Education Support Plan	points	points
Plan	Hold a support meeting to design the Individualized Education Support Plan with parents	points	points
Do	Use the Individualized Education Support Plans when designing the individualized teaching plan	points	points
Check	Hold a support meeting with parents and confirm the support progress and results as provided outside of school	points	points
Act	Hold a support meeting with parents and revise the Individualized Education Support Plan	points	points

Q3 Developing an Individualized Teaching Plan
The Individualized Teaching Plan is a plan that formalizes school support. It develops a guideline and teaching methods so that all teachers can instruct children effectively, depending on each child's needs

		First	second
Research	Know all children who need the Individualized Teaching Plan	points	points
Plan	Individualized Teaching Plan are made for all children who need them	points	points
Do	According to the Individualized Teaching Plan, teachers are teaching and supporting children in the same manner	points	points
Check	Confirm the support progress and results as provided according to the Individualized Teaching Plan	points	points
Act	Revise the Individualized Teaching Plan	points	points

Q4 Planning in-school teachers' training on the special needs education
In-school teachers' training is needed to refresh teachers' understandings of special needs education and teaching skills.

		First	Second
Research	Confirm the teacher's needs to hold teacher's training on special needs education	points	points
Plan	Plan teacher's training on special needs education according to the confirmed needs	points	points
Do	Hold teacher's training on special needs education	points	points
Check	Confirm outcomes of the teacher's training on the special needs education	points	points
Act	Plan an improved teacher's training	points	points

Q5 Make parents aware of special needs education
All parents are enlightened on special needs education, through newsletters or parent-teacher conference as needed.

		First	second
Research	Confirm that all parents have information on special education that they need to know	points	points
Plan	Plan events for all parents to enlighten them on special needs education	points	points
Do	Execute planned events for all parents to enlighten them on special needs education	points	points
Check	Confirm the outcomes of activities to enlighten all parents	points	points
Act	Plan improved activities to enlighten all parents	points	points

Q6 Collaboration with external experts
To provide the proper educational support and cooperation with external experts as needed.

		First	second
Research	Know all external experts with whom to cooperate	points	points
Plan	Plan cooperation with external experts, such as consultation or holding a meeting	points	points
Do	Improve methods to support children or the student support system itself according to advice from external experts	points	points
Check	Confirm the process or the outcomes from cooperating with external experts	points	points
Act	Plan improved cooperation with external experts	points	points

Figure 1 Picture of the PDCA Cycle Promoting Sheet (Matsumoto, 2016)

Procedure. We sent a request letters that mentioned the URL and password to download the excel files of the questionnaire to both elementary and junior high schools by post. We collected the excel files from schools online by means of dropbox or by email. We asked the coordinators of each school to complete the questionnaire and to answer the "PDCA cycle promoting sheet (Matsumoto, 2016)".

Analyze. Excel Statistics ver.2.14 (BellCurve, JAPAN) was used to perform all the

statistical analyses. A *t*-test was performed to analyze all data.

Results

Profiles of the participants.

Participant profiles are shown in Table 1. Answers were obtained from all areas in Japan. Half of the schools in which the respondents work have between 200–500 children. Approximately 60% of the elementary schools hold school committees once or twice a month. Approximately 60% of participants were over the age of 50, while 74% had more than 20 years of experience as a teacher.

Table 1: *The profiles of the participants and their Schools*

	Elementary School (N=24)		Junior high school (N=26)		Total (N=50)	
School information						
District						
Hokkaido/Tohoku	6	(25%)	1	(4%)	7	(14%)
Kanto	7	(30%)	6	(23%)	13	(26%)
Chubu	4	(18%)	3	(12%)	7	(14%)
Kinki	2	(8%)	1	(4%)	3	(6%)
Chugoku	1	(4%)	6	(23%)	7	(14%)
Shikoku	2	(8%)	4	(15%)	6	(12%)
Kyusyu/Okinawa	2	(8%)	5	(19%)	7	(14%)
Number of children						
Less than 200	5	(21%)	6	(23%)	11	(22%)
Within 200-500	8	(33%)	13	(50%)	21	(46%)
Over 500	11	(46%)	7	(27%)	18	(36%)
Frequency of holding school committee						
Once a week	0	(0%)	5	(19%)	5	(10%)
Twice a month	1	(4%)	0	(0%)	1	(2%)
Once a month	14	(58%)	5	(19%)	19	(38%)
Once a semester	6	(25%)	12	(46%)	18	(36%)
Only when necessary	3	(13%)	4	(16%)	7	(14%)
Profile of the participants						
Age						
Twenties	2	(8%)	2	(8%)	4	(8%)
Thirties	1	(4%)	3	(11%)	4	(8%)
Forties	5	(21%)	7	(27%)	12	(24%)
Fifties	16	(67%)	14	(54%)	30	(60%)
Teacher experience						
Under 10 years	4	(16%)	5	(18%)	9	(18%)
10-19 years	3	(13%)	1	(4%)	4	(8%)
20-29 years	11	(46%)	10	(38%)	21	(42%)
Over 30 years	6	(25%)	10	(38%)	16	(32%)

Impact of the coordinator's conditions on their difficulty in cooperation with other teachers.

The difference between the two groups, namely those having (1) difficulty in cooperation or (2) good cooperation with other teachers, is illustrated in Table 2. According to the *t*-test, there are no significant difference between group (1) and (2) in all three questions regarding respondent careers and their working environment: the experience as both coordinators (t(48)=0.51, n.s.) and teachers (t(48)=0.04, n.s.), the number of coordinators in one school (t(48)=0.26, n.s.).

Table 2 The impact of the coordinator's conditions on their difficulty in cooperation with other teachers

	(1) Difficuly in cooperation (N=17)		(2) Good cooperation (N=32)		T-value
	Average	SD	Average	SD	
Experience as a coordinator	4.06	0.66	3.64	0.49	0.51 n.s.
Experience as a teacher	23.65	1.85	23.52	2.05	0.04 n.s.
Number of the coordinators per school	1.64	0.15	1.71	0.22	0.26 n.s.

Effect of the coordinator's having difficulty in cooperation with other teachers on the PDCA cycle.

Figure 2 shows the difference in the PDCA cycle between coordinators working in groups having (1) difficulty in cooperation and (2) good cooperation. According to the *t*-test, the mean value of coordinators ensuring good cooperation is higher than that of those facing difficulties in cooperation. The difference are shown in Research (t(48)=2.40, p<.05), Do (t(48)=2.16, p<.05) and Check (t(48)=2.22, p<.05) stages alone.

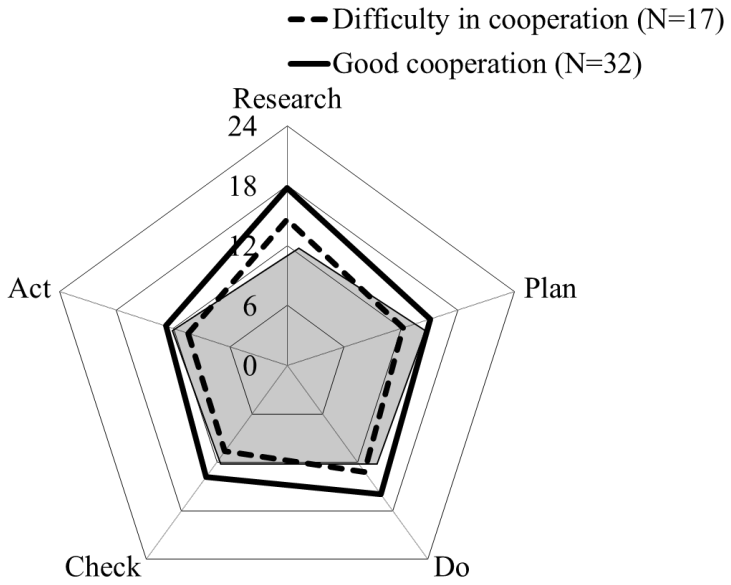


Figure 2 The difference in mean values according to the existence of difficulties in cooperation of coordinators

※ The gray pentagon depicts the individual level.

Effect of the experience as a coordinator on the PDCA cycle.

Figure 3 shows the difference between coordinators in groups having (3) within two years or (4) more than five years of experience as a coordinator, in addition to the more than 20 years of experience as a teacher. There is no difference between the mean value of the group (3) and (4) at any stages of the PDCA cycle.

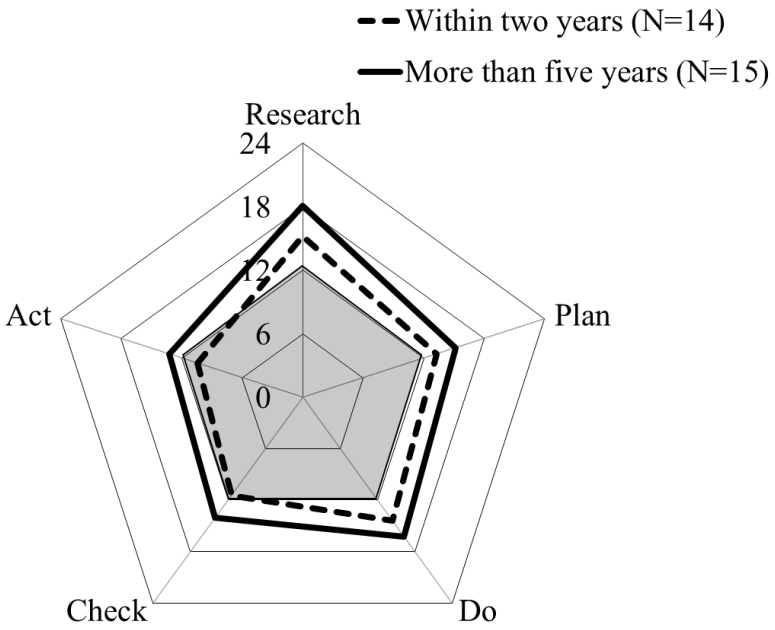


Figure 3 The difference in mean values according to the experience of coordinators

※ The gray pentagon depicts the individual level.

Effects of the number of coordinators on the PDCA cycle.

Figure 4 shows the difference of the PDCA cycle between coordinators working individually and as a team. The mean value of team coordinators is higher than that of individual coordinators. The difference are shown in Plan ($t(48)=3.35$, $p<.05$), Do ($t(48)=2.88$, $p<.05$), Check ($t(48)=2.07$, $p<.05$) stages alone.

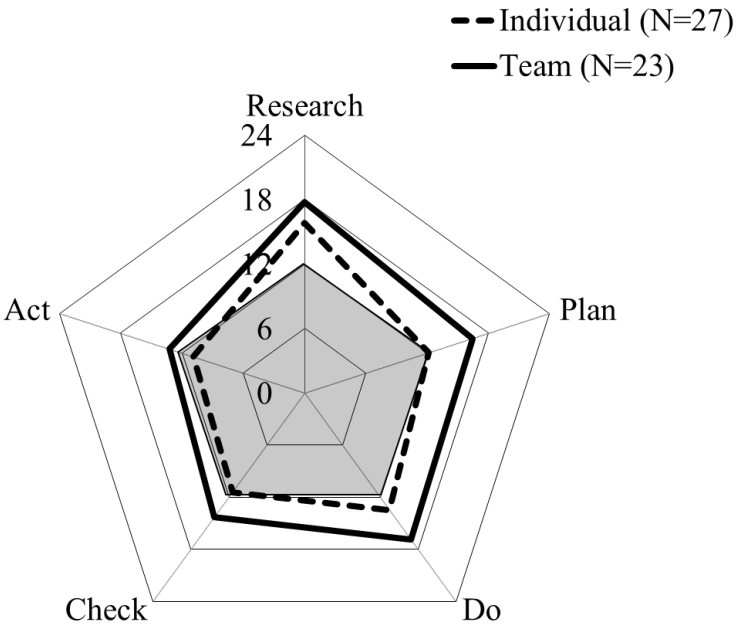


Figure 4 The difference in mean values according to the number of coordinators

※ The gray pentagon depicts the individual level.

Discussion

Rather than the lack of experience or available coordinators, it is the absence of a systematic student support system that causes the difficulty in cooperation between coordinators and teachers. In other words, it is likely that if the student support system is working systematically, then the difficulty in cooperation between coordinators and teachers will be reduced. The results of this study indicate that coordinators feel that they are cooperating well when they share the information (Research) and work (Do), and check the result (Check) in organizational groups. Thus, it is important to set meetings where coordinators can share information with other teachers regularly. This conclusion validates Matsumoto's (2016) report that holding regular school committee meetings will enable student support systems to become more systematic

However, experience as a teacher and coordinator will not affect the systematic PDCA cycle of the student support system, nor will the coordinator's degree of experience. Miyaki and Kifune (2011) have shown that coordinators with less experience have more difficulty than those with ample experience. However, we did not observe this difference in our survey. Nonetheless, experience as a coordinator does not reduce the difficulty in cooperation with other teachers.

The results show that while being a team will not reduce coordinator's facing difficulty in cooperating with other teachers, it will improve the student support system by making it more systematic—especially in the Plan, Do, and Check stages. If the coordinator works individually, then they can just do when they want. If they work in a team, however, they must negotiate with one other and plan before they act. The coordinator team will spontaneously lead the student support system in a more systematic manner.

We suggest that school principals appoint a minimum of two coordinators in their schools. The results revealed that holding a school committee meeting on a regular basis (Matsumoto, 2016) and having coordinators work in a team will promote the PDCA cycle of the student support systems, but that coordinator experience will not. This means that improving the organization is an effective means of making the student support system more systematic and reducing the difficulty that coordinators face. As such, we recommend that the school principal appoint more than two coordinators per school in addition to evidencing a basic policy for special needs education as one of the pillars of the school management plan.

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