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De Bono's Six Hats Thinking Strategy for All Content Areas

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De Bono's Six Hats Thinking Strategy for All Content Areas

Abstract

Problem-solving and collaboration require people to compromise, negotiate, and brainstorm to understand, create, manage, judge, and be intuitive and remain positive and calm while working as a team to address problems. Teachers can teach students to collaborate and problem-solve in any content area using de Bono's Six Thinking Hats Strategy. Using de Bono's strategy, university students in this study explored learning hats and ways to apply learning hat properties to collaborate and problem solve in group activities. Researchers employed a mixed-method study enlisting both general education and special education pre-service undergraduate and in-service graduate teachers to discover personal thinking hat characteristics.

Keywords

deBono's Thinking, Mixed Methods, Inclusion, Collaboration, Lesson planning, differentiation

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Declaration of Interest

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Abstract

Problem-solving and collaboration require people to compromise, negotiate, and brainstorm to understand, create, manage, judge, and be intuitive and remain positive and calm while working as a team to address problems. Teachers can teach students to collaborate and problem-solve in any content area using de Bono's Six Thinking Hats Strategy. Using de Bono's strategy, university students in this study explored learning hats and ways to apply learning hat properties to collaborate and problem solve in group activities. Researchers employed a mixed-method study enlisting both general education and special education pre-service undergraduate and in-service graduate teachers to discover personal thinking hat characteristics.

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De Bono's Six Hats Thinking Strategy for All Content Areas

Content areas such as reading and social studies use comprehension critical thinking strategies regularly to assist students in considering all views for learning a topic. Today's educational premise revolves around "giving students ownership of learning" (Popham, 2008, p. 80). According to White (1998), "Increasing student involvement, in order to develop the lifelong learning skills that students need to compete professionally" assists in students becoming accountable and responsible for their learning (p. 190). White (1998) noted approaches such as "team-based learning, course assignments designed to develop oral and written communication skills and the use of case studies" (p. 190) provide activities that help students become more responsible for their learning. White shared information on collaborative working relationships within lesson planning, grouping students, and the teaching and learning processes. Findings from the data collected from the pre-service undergraduate student and graduate teacher participants in de Bono's Six Thinking Hats survey were revealed to readers.

Engaged students interact with the lessons rather than sit on the sidelines and have the teacher deliver information. These students get involved with learning new material or ideas when asked open-ended questions in which they must use critical thinking to reach an answer. Providing students with part of the information tweaks their interests. Team exercises allow students to build and eliminate dependability issues when working with another person. Teaching and learning do not occur singularly; teaching and learning occur through collaboration. Collaborative brainstorming discussions help to foster ownership and community. Students must continue to improve communication skills to resolve conflicts and seek higher positions as future employees when becoming adults.

Dr. de Bono created the Six Thinking Hats method, a proactive process to assist teams in working together collaboratively. Teams are encouraged to use parallel thinking to promote equality in all ideas and demonstrate that all perspectives are valuable. Diversity in the teams includes at least one of the following types of thinkers: White hat thinkers, Red hat thinkers, Black hat thinkers, Green hat thinkers, Blue hat thinkers, and Yellow hat thinkers. A survey of a few questions determines each person's thinking hat color. Teachers must remember that the hat colors are not specifically descriptors of the people wearing the hats but of the behaviors exhibited by the people wearing the hats. The hat colors represent directions of thinking and thinking processes (de Bono,1999). Table 1 summarizes the Hat Colors to help make the imaging easier to understand and much clearer.

Table 1: Color of Hat and its Function

Color of Hat	Function
White Hat	White is neutral and objective. The white hat is concerned with objectives and facts.
Red Hat	Red suggests anger (seeing red), rage and emotions. The red hat give the emotional view.
Black Hat	Black is somber and serious. The black hat is cautious and careful. It points out the weaknesses in an idea.
Yellow Hat	Yellow is sunny and positive. The yellow hat is optimistic and covers hope and positive thinking.
Green Hat	Green is grass, vegetation, and abundant, fertile growth. The green hat indicates creativity and new ideas.
Blue Hat	Blue is cool, and is also the color of the sky which is above everything else. The blue hat is concerned with control, the organization of

the thinking process, and the use of the other hats.

(deBono, 1999)

As de Bono (1999) discussed, teaching and learning processes using the Six Thinking Hats Method provide students benefits in all content areas and acquire lifelong adult skills. Benefits of using the Six Thinking Hats method include learning to accept and allow peers to voice ideas without risk and fear of ridicule. These benefits allow students to gain confidence in sharing, collaborating, and discussing ideas respectfully. Another benefit includes the awareness of multiple perspectives when sharing information. Creating acceptance of more than one way to solve a problem is a valuable life lesson to learn and apply in all subjects and areas. Switching gears, learning the rules for the game of thinking, and providing a focus on thinking lead to more creative thinking when using the Six Thinking Hats method. Critical thinking skills such as these just mentioned assist students in developing deeper metacognitive and higher-order thinking and processing skills required to apply and synthesize knowledge. The Six Thinking Hats method benefits include improved communication and decision-making skills. Working in silos is an activity and a skill of the past; working collaboratively is the current skill needed and used in all areas of industry. Collaboration requires sharing the work process. Sharing the work process involves shared communication and decision-making.

A sample group activity example might consist of the following thinking roles:

White Hat: Presents the facts of the activity to the group.

Green Hat: Generates ideas on how the group could do the activity.

Yellow Hat: Evaluates the benefits of the ideas presented and list the pros of each idea.

Black Hat: Lists the drawbacks and cons of the ideas

Red Hat: Polls everyone for their feelings about the alternative's ideas. likes, and dislikes

Blue Hat: Summarizes and plans who, what, and how the activity will be completed.

Literature Review

Six Thinking Hats provides a limited review of educationally- and theoretically-based research articles to apply to classroom instructional strategies and interventions. However, Gregory and Masters (2012) discussed using the Six Thinking Hats strategy to teach students to use metacognitive mindsets for problem-solving and decision-making. The Thinking Hats framework guides students to discover new ways to speculate and consider other alternatives for completing tasks. Engaging learners to interact with different viewpoints provides growth opportunities and connections for advanced performances and achievements (Gregory & Masters, 2012).

All students working in collaborative groups have a voice using the Six Thinking Hats strategy (de Beer & Whitlock, 2009). Developing cultural diversity lessons can be achieved using the thinking hats strategy by applying "indigenous knowledge" (de Beer & Whitlock, 2009, p. 209) all students bring to the discussions. Indigenous knowledge (IK) is defined as the "sum total of knowledge and skills people possess enabling them to get the most out of their natural environment" (de Beer & Whitlock, 2009, p. 210). Small group discussions using the thinking hats structure provide students the activity to think about topics from other dimensions and different perspectives. Each color hat has a job described and outlined by the characteristics of that particular hat to direct the discussion of the topic. Through the colored hat discussions,

students can realize different attitudes and mindsets related to the issues of the activity task (de Beer & Whitlock, 2009).

Teaching and learning lessons and strategies for pre-service students at universities need creative problem-solving applications for collaborative group settings (Paraskeve et al., 2015). The research provided by Paraskeve et al. (2015) suggested all participants wear the same color hat to align thinking in one direction to solve one problem at a time before moving forward with a different colored hat perspective of thinking. When all active participants are thinking in one manner or one direction, many varying backgrounds come into focus, providing an array of suggestions for that area of consideration of the problem. By changing colored hats, everyone can present additional viewpoints for the latter aspect of the problem. After that, participants can follow the sequence of each hat choice.

Purpose of the Study

This two-phase mixed methods study aimed to obtain statistical, quantitative results from a participant sample and follow with the same participant sample to probe further with additional questions. In the first phase of the quantitative research study. Participants of pre-service undergraduate general education and exceptional education teacher candidates and current graduate special education teachers identified which color of the Six Thinking Hats best met their personality. This data was gathered quantitatively to determine how many of each color represented within the group of participants. The second phase of the research study required participants to respond qualitatively to additional questions and to reflect upon the Six Thinking Hats characteristics on how the revelation affected their beliefs about teaching, collaboration with other teachers, and professional strategies for working with students.

A mixed-methods research approach was appropriate for this study because of the qualities of the philosophical guidance and analysis provided from both quantitative and qualitative data collected, conveying clear understandings (Creswell, 2003). Our mixed-methods research study overlaps the disposition expectation areas pre-service teachers and veteran teachers demonstrate through collaborative teaching practices such as acceptance in inclusive environments, responsibility, caring for the tradition of planning lesson planning, and other academic disciplines observed in instructional processes (Creswell, 2003).

Research Questions

Two central research questions guided this study. Working in collaborative groups as pre-service and in-service teachers is key to creating successful lessons and making instructional decisions for optimal student learning. The research questions were selected to support positive collaborations for planning and improving the teaching and learning process in the actual classroom. The co-teaching model is no longer the exception. It is the norm. Therefore, leading to asking the questions of how to make the best pairings of team teachers for the inclusion model of services.

RQ1- How does knowing your hat's color influence your ability to collaborate with others?

H1- Knowing the individual color hats of others will assist teachers in a flexible grouping of students.

H2- Knowing the individual color hats of others will assist teachers in working with others.

RQ 2: How does knowing the color of your hat influence the way you plan a lesson?

H1- Knowing individual color hats of others will assist teachers in writing plans to differentiate for all students.

Methodology

The method chosen for the study was a mixed method. In this mixed-methods research study, participants were provided an online link to a 5-question survey of questions used to determine the color hat representative of the personal or professional personality based on the questions' chosen responses. The mixed-method research study was most appropriate to review the varied paradigms and philosophical approaches used in the discovery with the follow-up questionnaire. The study required knowing each participant's color hat to make influential collaborative groups. Alternatively, participants needed to evaluate how the thinking hat strategy could be used for grouping and lesson planning in the classroom.

Paradigm shifts with different philosophical thinking about writing lesson plans occurred during this reflective assessment process. After receiving the results of the selected color hat, participants were grouped heterogeneously in collaborative lesson planning work teams. These teams worked together to plan a math lesson from the thinking that colors different perspectives. Finally, each participant was asked to reflect upon how this color hat characteristic applies to teaching and collaborating with colleagues within the classroom setting.

Participants

The participants in the study were undergraduate, pre-service students in the Elementary Education Certification Program, the Learning Behavior Disabilities and Elementary or Middle school dual certification program, and current in-service graduate students in the Master of Education Special Education program. Participants were provided an electronic questionnaire to

participate in the class activities. Students were awarded points for taking the questionnaire but were not penalized if they decided not to take the questionnaire. Participation was strictly voluntary. Five male and 97 female participants were in this study. Of these participants, 84 were undergraduates, and 18 were graduate students. Some of the undergraduate students participated in multiple classes. Their data was only counted once. Students were provided an instructional Microsoft Powerpoint explaining the Six Thinking Hats strategy before taking the survey. Institutional Research Board approval (see appendix) was provided for this research study. Not everyone in the study responded to the additional questionnaire.

Application of Strategy

Using the Six Thinking Hats Strategy in the educational classroom has two possibilities. One way to use the strategy is to use it collaboratively, and the other way to use it is individual. Students need to learn to work together collaboratively; therefore, the Six Thinking Hats strategy provides a structure for working together in the decision-making process. Individually, students can learn to view the decision-making process from all color hat viewpoints and characteristics. Kalelioglu and Gulbahar (2014) mentioned, "With the Six Thinking Hats instructional techniques, students share ideas about the problem from different perspectives according to the hat they are wearing" (p. 252).

Planning active and engaging lessons requires purposeful thought concerning all elements from the beginning of the interest and background building to the final summative assessment. Better lessons are planned when a collaborative group of teachers approaches the process by using the thinking hats strategy. The White Hat thinking guides teachers to look at the essential information, facts, and standards that must be taught that are true and can be checked (de

Bono,1999). After determining the standards to be addressed, Black Hat thinking, the basis of critical thinking, leads the planning stage to question the strengths of the evidence being taught, the conclusions drawn from the evidence presented, and the assessments to determine the learning of the information (de Bono,1999). Teaching, learning, and demonstrating knowledge gained are essential aspects of the planning process. White and Black hat thinking guides this part of the planning process.

The next phase of planning concerns differentiating instruction for struggling students. Green Hat thinking is interested in the creative alternatives used for scaffolding instruction and differentiating lesson plans for students with disabilities. This thinking strategy involves arranging research-based intervention choices to meet the various needs of the different disabilities in the inclusion classroom. The Yellow Hat thinking is optimistic and ensures these ideas are implemented. Yellow Hat's thinking is constructive and optimistic. Differentiating instruction can be overwhelming and frustrating; therefore, Yellow Hat thinking can help contribute positive collaboration and viewpoints for planning and implementing these strategies.

The final stages of lesson planning use Blue and Red hat thinking strategies. Blue Hat thinking involves facilitation and organization. Red Hat thinking involves emotions and intuition. Teachers are the facilitators of all the lessons implemented within the classrooms. All special education and general education teachers plan and implement lessons; therefore, are the facilitators using Blue Hat thinking to teach. Lessons do not always go exactly as planned. Teachers must learn to be flexible. Using teacher's intuition, Red Hat thinking helps teachers learn to combine both Blue and Red Hat thinking to keep the lesson moving forward and students learning. Red Hat thinking and teaching involves student reactions to the lesson, the

delivery of the lesson, confusions, teacher reactions, and fears. Teaching involves many factors. Teachers must plan effectively to meet the needs of all students in an often-diverse classroom setting.

Activities and lessons require teachers follow curriculum guides and state standards to ensure students are taught elements to be assessed. Gunter, Estes, and Mintz (2007) reported that teachers should follow these general steps of instructional planning: "study state standards, collect and reflect on student needs, define objectives in the form of what you want students to understand and do, construct assessments, create lessons supporting students, and use a variety of instructional models" (pp. 1-2). Reflection and questioning are two aspects teachers can implement into daily lesson planning. Three areas of concern for questions and reflection are curriculum, what to be taught, instruction, how to teach, and student needs.

Gunter, Estes, and Mintz (2007) shared, "Educational goals are general statements of intent that reflect 1) the nature of learning, 2) the needs of learners, and 3) the societal purpose of schooling, usually expressed in terms of learning standards" (p. 3). When planning the educational goals of the lessons of the units provided in the curriculum guides, teachers must consider student learning styles, student learning needs, and the state's expectations to be assessed on examinations. Students should be the main focus of all teacher planning and instruction. According to Tomlinson and McTighe (2006), our elements of effective classrooms are "students, environment, content, and instruction" (p. 2) as "all students benefit from and are entitled to a curriculum that develops and deepens their understanding" (p. 4). Instructional organization and planning must take the students, the classroom environment, the curriculum content, and the instructional methods and strategies into serious consideration for achieving

academic success. Great teachers plan for students they will be reaching and teaching, where they will be delivering this instruction, what skills and lessons they will be delivering, and how the lessons and skills will be delivered.

Marsh and Willis (2003) discussed curriculum components that teachers should reflect on when planning each lesson for all student abilities and levels. Seven components are provided, including "instructional objectives, skills, knowledge, materials, integration, values, and testing" (pp. 258-259). Teachers develop questions to ensure thorough planning occurs and all possibilities have been covered during each lesson's planning and organization time.

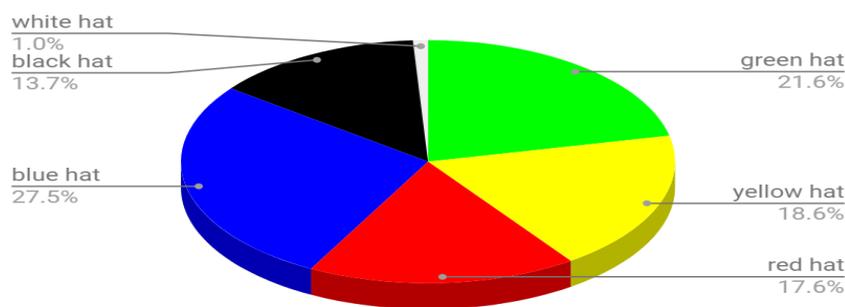
Data

Data for this research study was collected after students took the online web-provided Six Thinking Hats survey. Students responded to a written prompt in Canvas (the learning management system) to explain the color hat received after taking the survey and why it was perceived as the appropriate hat choice to fit their teaching personalities. The chart below (Table 2) represents the number of students per class and the color hat representations completed by the survey. As demonstrated in the data graph below (Figure 1), most students identify with Green, Yellow, Red, and Blue hats. Out of all hat choices and students, only one was considered a White hat thinker (1%). Thirteen out of 96 (14%) were Black hat thinkers. Green hat thinkers comprised 21 out of 96 students (22%). Eighteen out of 96 (19%) were Yellow hat thinkers. Red hat thinkers comprised 17 out of 96 (18%) thinkers. Finally, blue hat thinkers made up the most significant percentage of thinkers at 27 out of 96 and 28% of students. Knowing your color is the first step in answering the first research question: How does knowing your hat's color influence your ability to collaborate with others?

Table 2: Distribution of Hat Colors in 5 University Classes

Class	Total # of Students	Green Hat	Yellow Hat	Red Hat	Blue Hat	Black Hat	White Hat	Types of classes
Class A	20	5	2	2	7	4	0	(undergrad only Elem)
Class B	16	2	3	5	4	1	1	undergrad only Elem
Class C	10	2	1	3	3	1	0	(undergrad only SED)
Class D	21	5	4	2	6	2	0	(hybrid UG & G SED)
Class E	29	7	5	5	7	5	0	(undergrad SED)
totals	96	21	18	17	27	13	1	
%		22%	19%	18%	28%	14%	1%	

Figure 1 Percentages of Class Color Hat Totals



Students were then asked to respond to an additional set of questions (see appendix) related to the Six Thinking Hats survey by collaborating, grouping students, lesson planning, choosing hat colors, and working relationships. The quantitative and qualitative data were sorted and analyzed to understand how and why students responded in the manner completed to reveal answers to our research questions. Their thought versus actual color hat data is presented in the data chart below (Table 3). This information provided an insight into their perceptions about the color hat received versus the color hat they thought they would receive. As identified below in Table 3, the participants perceived their color hat would be one color prior to taking the survey, and the results from the survey demonstrated an entirely different color hat. This insight helped the participants reflect upon how perceptions can be incorrect and more data is needed prior to making a final decision, especially regarding students, placements, groupings, and interventions.

Table 3 Perceived Color as Compared to Actual Color

Perceived: Actual	Number
Blue to blue	11
Green to green	10
Red to red	9
Yellow to yellow	9
White to white	2
Black to black	5
Other combinations	50

total 96

According to the qualitative data reviewed and analyzed as represented by the chart below (Table 4), Blue hat thinkers believe in collaborating with green, white, and yellow hat thinkers. Green hat thinkers can collaborate best with yellow, red, white, and blue hat thinkers. Red hat thinkers will collaborate best with yellow, green, and blue hat thinkers.

Yellow hat thinkers will collaborate best with green and blue hat thinkers. White and black hat thinkers are rare and will collaborate best with blue and yellow hat thinkers. Reviewing this information and knowing the hat color provided insights concerning collaboration partnerships and grouping students for project-based learning. Teachers need to be cognizant of which students work best together. Placing high achieving students with low achieving students may not always be the best pairings for the planned learning project. Teachers need to ask and think about the collaborative project's instructional standards and learning outcomes. Content is not the only purpose for education; social, emotional, and life skills are the hidden curriculum skills taught throughout the educational realm to prepare students for life after public education.

Table 4: Collaboration Information Qualitative Data

Blue Hats work best with	Green Hats Work best with	Red Hats work best with	Black Hats work best with	White hats work best with	Yellow Hats work best with
White- 7	White- 3	White- 2	White- 0	White- 1	White- 1
Green 8	Green 3	Green 3	Green 6	Green 0	Green 7
Yellow- 6	Yellow- 6	Yellow- 9	Yellow- 2	Yellow- 0	Yellow- 1

Red -1	Red -4	Red -0	Red -0	Red -0	Red -0
Blue-1	Blue-3	Blue-4	Blue-2	Blue-1	Blue-4
Black -1	Black -1	Black -0	Black -0	Black -0	Black -1

Planning Lessons Information Qualitative Data

Planning lessons is a difficult task, and planning for students to be in small groups or flexible learning groups is frequently one of the most complex parts of a teacher's job. Putting students together requires a unique level of dynamics. The use of small class learning stations in co-teaching and collaborative working environments requires that teachers plan effectively and efficiently and know which students can work together to learn accordingly? From the information below (Table 5), the data suggest whether students take the quiz depends upon the activity and the child. Other suggestions include Green & White, Blue & White, Red & White, and Yellow & Black pairings. Another suggestion is not to pair two of the same color hats together. Using the Six Thinking Hats survey information provides teachers with another strategy of planning for differentiation to meet all students' needs by thinking about their particular color hat identity. Knowing the color hat identity reveals how the student will organize and receive information. Knowing each teacher's color hat may reveal how the teacher plans and teaches.

The inclusive classroom provides special education and general education teachers opportunities to co-teach in multiple modalities. The Six thinking hats survey provides an insight into the working relationship of two paired teachers and how these two teachers might

compliment or criticize the working habits of each other. Respondents' comments confirmed our hypothesis with statements such as "Pairing green and white hats to work together would provide a creative and a concrete factual element for planning and the two would have endless possibilities of ideas to provide for student activities". Many other respondents commented, "pair students together that would balance each other out such as opposites like red and white hats for the emotional and factual; black and yellow for the positive and judgmental; and blue and green for the organized and the creative sides". This was a common pairing comment made throughout the reflections, and another one to help make this determination was to have the students take the quiz if age-appropriate.

Reflections from the participants-initiated discussions with the classroom concerning group planning and the questions related to what if there are too many of one color within the group? What happens when you have too many blue thinkers organizing and leading the team and not enough of the colors to complete the rest of the tasks needed to get everything planned? The discussions revealed the need for everyone to learn to adapt to other thinking hat roles and not to only remain in one thinking hat mode. As teachers, we must help all our students learn to think in all the hat colors and learn to use multiple color modalities of thinking to problem-solve.

Using de Bono's thinking hat's strategy should be used and can be used in various content areas. Teachers can physically wear different color hats to help remind students of the mindset of thinking for the day in problem-solving related to the topic and create scenarios and activities to be discussed and completed. DeBono's thinking hats strategy creates a well-rounded, scientifically based researcher for our future student population.

Table 5 Thinking Hat Pairing

Blue Hats plan best with	Green Hats plan best with	Red Hats plan best with	Black Hats plan best with	White hats plan best with	Yellow Hats plan best with
Green & white -2	Blue & green 6	Black & white 3	Green & white 2	Yellow & black	NO Two hats same color
Red & white 4	Blue & yellow -1	Blue & white 2	Black & yellow 3	Yellow and green	
Blue & white -3	Black red & yellow 1	Black & green -1	Blue & black 2		Depends on child/activity
Black & white 1	White/red/black & yellow	Green & white-1	Red & green 2		Blue & green 3
Green/blue & white 2	Blue & white-2	Yellow & green -2	White & blue 2		Blue & white 2
Yellow & white 1	Green & white -3	Yellow & blue-1	Depends on child		Yellow & green 1
Black & yellow 3	Yellow & black -1	Green & red-1	black & green 1		White yellow & red
Red & green -3	Green & yellow-2	Green & blue-2	green & yellow 1		Black blue & green 2
Black & green 2	Green & black -4	Blue & red-1	red & yellow		White & black
Blue & green 3	Red & yellow-1	Yellow & red -2	black & white		Yellow & black
Yellow & green -2	White & yellow -1				white & green

Blue & red -2

NOT 2 of same
color

Discussion / Findings

Teaching requires critical and flexible thinkers. Educators teaching all grades and ability levels switch between different colored hats when using thinking skills throughout the instructional day to ensure all arising issues are addressed in a calm and assertive manner. After learning about and taking the Six Thinking Hats survey, each participant revealed an aha moment. Moments repeatedly shared included the following: "The green hat could come up with creative ideas, and the blue hat would be good at processing exactly how to put the green hat's idea into action" or "pair the blue hat and green hat together so one student can come up with some great ideas and the other student can help the creative student put it all together in an organized way". These responses are the comments regarding blue and green hats working together, which confirm the hypothesis and results from the research questions.

The results of the Six Thinking Hats research study revealed that knowing the color hat provides participants with a deeper understanding of their personality; therefore, from a collaborative viewpoint, these participants can identify students and colleagues with whom they can work well and those students and colleagues whom they will not work well. Lesson planning using the Six Thinking Hats strategy may assist teachers in critically determining groups of students and diverse interventions and approaches to meet all students' needs. Teachers may be more effective and efficient using the Six Thinking Hats strategy.

Uncertainties and self-doubts regarding skills and abilities may result in ineffective teaching practices and unmotivated and unenthusiastic teachers (Duke, 2004). DuFour and Eaker (1998) discussed the influences of "overwhelmed people, unenthusiastic people, lack of leadership, top-down implementation without buy-in, unwillingness to change, and the leader failed to gain an acceptable level of support before implementation" as inhibitors and resisters to change plans implemented by leaders (p. 48). Implementing change plans without proper prior assessment causes people to feel anxious and stressed. A lack of leadership communicates that the change plan is not essential; therefore, others will not join in the process. On the other hand, participants may rebel and avoid supporting the plan when leadership is mandated.

Conclusion

The completed research study using de Bono's Six Thinking Hats strategy revealed an innovative, collaborative method for teachers for lesson planning and co-teaching in an inclusive classroom. Special and general education teachers can use this strategy to develop differentiated lesson plans, flexible groupings, and appropriate assessments. Engaging and interactive lessons are the cornerstone of critical higher-order learning activities. Students with special needs learn and achieve faster in academic settings when the instruction has been provided in a differentiated, explicit, and specially designed method. Training teachers to use methods and strategies such as direct instruction, engaging activities, eliciting discussions, and higher-order thinking skills allows students to activate learning through the gradual release model of instruction. Progress monitoring will assist teachers in determining the achievement progress levels being made over time and the interventions that are working or not working.

When interventions are not working, changes in the interventions need to be made. Using student learning styles to determine appropriate differentiated instructional methods provides teachers with the best practices for meeting student needs. Helping students to begin to love learning is an important step in the instructional process.

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Declaration of Interest

The authors declare there is no conflict of interest.

Appendix A: Six Thinking Hat Survey

<https://www.proprofs.com/quiz-school/story.php?title=which-thinking-hat-are-you>

- When you have a group project to tackle, you:
 - A.
Start brainstorming, and come up with all of these awesome ideas.
 - B.
Look more towards all of the good things that could happen in the end.
 - C.
Look more towards all of the bad things that could happen in the end.
 - D.
Immediately take charge and become the "boss."
 - E.
Make sure that EVERYONE in the group is okay with the decisions being made.
- What do you feel like doing first when there is a problem to solve?
 - A.
Writing down all of the obvious information on a piece of paper.
 - B.
Ask negative questions like "What if we loose all of the money in the process?"
 - C.
Start coming up with solutions right away.
 - D.
Look more at the benefits you'll get.
 - E.
Get organized, and write out a plan on how to fix this.
- Which best describes you?

- A.
The one who get easily frustrated when things are out of place.
- B.
The one who enjoys being innovative and creative.
- C.
The one who gets attached to others easily.
- D.
The one who is really a simple, easy to understand individual.
- E.
The one who is always in a good mood, and likes to motivate others.
- Are you a:
 - A.
Optimistic thinker.
 - B.
Critical thinker.
- When you get stressed out, you:
 - A.
I never get stressed out.
 - B.
I tend to over-react.
 - C.
I look on the bright side.
 - D.
I think negative thoughts.
 - E.

I cry in my bedroom.

- When working with a team to solve a problem, I would tend to focus on:

- A.

Objective facts

- B.

New ways of thinking about a problem

- C.

Making sure the logic behind any argument is flawless

- D.

Leading the problem solving process

- E.

The statistical evidence

- F.

Everyone's emotions

- What do people generally describe you as?

- A.

Methodical

- B.

Cheerful

- C.

Intuitive

- D.

Cautious

- E.

Innovative

- F.
Intelligent
- What would you do if you were asked to work on a project with a group of people?
 - A.
Brainstorm everybody's ideas
 - B.
Try to objectively include everybody's ideas
 - C.
Focus on the usefulness of the work to be done
 - D.
Focus on the risks
 - E.
Assume the leadership capacity of the group
 - F.
Make sure that everyone is on-board each step of the way
- How do you handle stress?
 - A.
By looking for the root of the problem and working on eliminating it
 - B.
Making a list of the individual issues and trying to solve them
 - C.
Thinking about positive things instead
 - D.
Meditating or doing yoga
 - E.

By finding ways to vent

○ F.

By taking it out on other people

• What is your biggest strength from these?

○ A.

Being a good leader

○ B.

Being unbiased

○ C.

Being positive

○ D.

Having an original though process

○ E.

Being empathetic

○ F.

Ability to take criticism

Appendix B

Six Thinking Hats Bonus Activity (worth 10 bonus points)

<http://www.proprofs.com/quiz-school/story.php?title=which-thinking-hat-are-you>

Use this link to take the Six Thinking Hats survey to find out which thinking hat you are.

Write a reflection about the information you find out concerning which hat you are, what it means to you as a teacher, how you can help your students to learn, learn to think and discuss in class better based upon the hat they are:

Blue hat

White hat

Green hat

Red hat

Black hat

Yellow hat

We will be discussing the Six Thinking Hats Learning Strategy and how to use it in our academic practice.

Appendix C

Six Thinking Hats- **Spring 2017** Follow Up Questionnaire

1. If you could change places with any hat- which hat would you choose & why?
2. Before taking the survey which hat did you think you would be & why?
3. Which hat do you think is your alter ego & why?
4. Which hat do you work best with & why?
5. In thinking about your future classrooms, how will you Pair your students to work together- which two hats do you think will work best together?
6. Which two do you think will not work best together?
7. Which three do you think will work best together?
8. Which three do you think will not work best together?
9. What types of activities would the thinking hats work best together?
10. What types of activities would the thinking hats NOT work well together?