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Academically Productive Classroom Discourse

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Academically Productive Classroom Discourse

By

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Abstract

This paper is focused on recent studies connected to Academically Productive Classroom Discourse (APCD) and its effects in the classroom, as well as findings implications for classroom practice and future research suggestions shared by the researchers. APCD can be defined as discussion that propels a deeper academic conversation forward in the classroom, as opposed to creating surface level conversations, halting the conversation, or moving the conversation in a circle. The purpose of this paper is to examine what areas of APCD have been studied and what the results of those studies imply for classroom practice and for more research. Twenty-five studies of wide variety were examined, including age groups from preschool to university level and spanning across many different countries. The studies were all conducted between 2009 and 2019, and there were many studies focused on elementary and middle school math and science, which may be a result of the implementation of Common Core State Standards in the United States in 2009. The researcher analyzed the theoretical/conceptual frameworks, research questions, methodologies, analyses and results, conclusions, and implications for future classroom practice and research of each study. It is suggested that teachers must be aware of their own instructional practice and their students' knowledge before implementing new strategies in the classroom. There is also a need for more research in the areas of teacher questioning and professional development in the context of APCD.

Keywords: academically productive classroom discourse, dialogic, questioning, collaboration, professional development

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Introduction

The power of words cannot be ignored when considering how many interpersonal interactions we have on a daily basis and how necessary they are to communication. Companies choose specific wording to promote their brand, legislators choose specific wording to create the exact law they have in mind, and couples choose specific wording when expressing their love for each other. In today's society, words are so easily spread through technology that much of the world has access to them; their reach seems to be infinite. This study focuses on the power of words in the classroom. Students spend a significant portion of their days at school, most of which is in the classroom, so the opportunity that teachers have to influence their students with their words is too great to waste. The majority of the time that teachers spend with their students is focused on whatever the lesson is for that day. When students are tuned in to the lesson, the social, emotional, and academic impact of the teacher's words can be immeasurable if they are carefully chosen.

Academically Productive Classroom Discourse (APCD), one type of expression that takes place in a classroom, can be defined as discussion that propels a deeper academic conversation forward, as opposed to creating surface level conversations, halting the conversation, or moving the conversation in a circle. Productive classroom discussion pushes students to think deeper and to critically interact with their thinking and their classmates' thinking. The concept of APCD is relevant to all classrooms, as learning typically does not take place without some kind of conversation in any given content area. Twenty-five studies were examined in order to better understand how teachers and students interact when APCD is used in a classroom context, as the effects have not only academic reach, but may even reach into the

domains of student motivation, teacher motivation, engagement, and emotional well-being at school.

Methods

I conducted a limited review of research published in scholarly, peer-reviewed journals between 2009 and 2019 to establish credibility within the field. I was interested in examining studies that had taken place in the past ten years because the Common Core State Standards and other educational reforms in the United States and abroad took place in 2009, and I hypothesized these new standards may have influenced classroom instructional practices. In particular, I was curious to discover if there was a shift in the way that content was being presented to students because of these new standards. I looked for studies in either public or private K-12 school contexts, in the United States, the United Kingdom, Australia, Germany, the Netherlands, South Africa, and the Czech Republic. Classroom contexts could be any content area and ability level, as well as ELL and Exceptional Student self-contained classrooms. However, studies needed to include a focus on classroom discourse and teacher talk.

The 25 selected studies meeting these criteria were read multiple times while I used descriptive and evaluative codes (Saldana, 2013) to identify teacher practices that involved some form of classroom discourse, and better yet directly connected to APCD. I placed this information within a matrix, in addition to demographics for each study, research questions, methodology, analysis and results, conclusions, future research suggestions, and implications for classroom practice. Of these 25 studies, fourteen took place in the United States, four in the United Kingdom, one in Germany, two in the Netherlands, one in the Czech Republic, one in South Africa, and two in Australia. Additionally, there were fourteen studies that were conducted in the elementary grades (K-5), six studies conducted in the middle school grades (6-

8), four studies conducted in the high school grades (9-12), and one study conducted at the university level. Further, seven studies were completed in math classrooms, three studies in science classrooms, one study in social studies classrooms, four studies in English language arts classrooms, one study in ELL classrooms, and nine studies in mixed-content classrooms, many of which were the specific combination of math and science.

When looking across these studies within the matrix and keeping in mind the primary intention of the research presented by each study, I identified five categories or themes: (1) Dialogic Discourse, (2) Teacher Questioning, (3) Student Collaboration, (4) Strategic Talk Moves, and (5) Professional Development. The studies were grouped according to the intention of the research or what the research questions were focused on. Though most studies primarily fit into one of these five categories, be aware that several studies reported findings that fit within multiple categories. I will now share findings across the 25 studies within these five categories, including specific details for each study, as well as findings across the grouped studies and implications for classroom practice by category.

Dialogic Discourse

Dialogic discourse was the first category identified when reviewing this research. According to Kathard, Pillay, and Pillay (2015), "In classrooms, dialogic interaction is characterized by dynamic interactions between teachers and learners who flexibly share turns as they co-create a network of meaning" (pg. 223).

Recent Studies

The first study, conducted by Kathard, Pillay, and Pillay (2015), focused on the frequency of three types of Teacher-Learner Interactions (TLIs) in four low income community schools, specifically focusing on grades four through six, with teachers of varying experience

levels. The study took place in Western Cape, South Africa and examined various content areas. The aim of the study was to describe TLIs within and across lessons during whole-class instruction along the interaction continuum. Whole class instruction was videoed and transcribed using a Dialogic Inquiry Tool in order to track monologic, transitional, and dialogic TLIs. The data showed that monologic TLIs were dominant, transitional TLIs were episodic, and there were no dialogic TLIs. It was determined that teacher questioning style and feedback were important factors to what type of TLI occurred. Open-ended questioning and expansion/challenging feedback specifically pushed the TLIs into the transitional area of the continuum.

This study, by Vrikki, Wheatley, Howe, Hennessey, and Mercer (2018), was conducted within the framework of 12 different dialogic talk moves. The focus was to find out how prior professional development affected the use of APCD, specifically dialogic forms. The researchers took video recordings of two lessons from 36 English primary classrooms from 28 different schools, focusing on two of three subjects, math English, and science. There were two groups: teachers who had prior professional development training on APCD and teachers who did not have prior professional development training on APCD. Twelve dialogic talk moves were coded and tracked throughout the lessons. It was determined that prior professional development may have influenced Reasoned talk, but not Elaborated talk, the two dialogic talk moves with the highest frequencies. From this information, the researchers concluded that teachers can still have good practice that promotes the use of dialogic forms of APCD without prior professional development, as there was a high frequency of Elaborated talk in both groups.

This next study by Boyd and Markarian (2015) focused on dialogic instructional stance and the idea of dialogue as functional rather than structural. The researchers claim that once a

teacher takes a dialogic instructional stance, dialogue becomes functional rather than structural. In order to support their claim, the researchers informally observed a 3rd grade classroom in a small college town in the Northeast for a year, focusing on morning meeting and chapter book read-aloud. The data gathered from the observations includes videos, transcripts, physical readings of log letters, and transcripts from three teacher interviews. The data showed that many exchanges that appeared to be structurally monologic were actually performing a dialogic function. For example, the teacher in the study, Michael, conducted a conversation using direct instruction and no questioning, a structurally monologic interaction, but the way that he conducted it still met the function of a dialogic interaction. The researchers concluded that epistemic and communal talk functions were more important for dialogic teaching than dialogically structured talk. Epistemic functions "shape the speaker's own perception of the world and represents it as knowledge," and communal functions "extend beyond exchanging pleasantries to establishing trusting relationships and accepting environments for conjecturing, developing ideas, and sharing connections to experience" (Rubin 1990). They also concluded that in order to discern dialogic teaching and learning, it was necessary to move beyond interactional structure and small pieces of classroom practice and look at the function of interactions as well as a variety of classroom practice that takes place over time.

The concept that the researchers, Kamberelis, McGinley, and Welker (2015), worked with for their study was "mangles of practice," which they defined as "the coalescence of planned and contingent forces, and they produce emergent or self-organizing transformations of ongoing social activities, as well as unpredictable outcomes or products" (Kamberelis et. al. 98). The researchers specifically framed their study in the context of literature discussions in an English Language Arts (ELA) class. Their research questions were focused on how teachers can

facilitate classroom discussions to promote deeper forms of inquiry and more dialogic forms of talk. One researcher spent two years observing one teacher who taught science, social studies, and ELA, though the focus was on the literature discussions that took place in the ELA classroom. These literature discussions were conducted daily with the students being placed in three small ability-groups, with the potential to move up or down between the groups throughout the year. The teacher first modeled how to lead the discussions then slowly turned it over to the students to lead. Data were collected through audio tapes which were then transcribed as well as field notes of one group's discussion of *My Brother Sam is Dead*. Analysis of the data showed that the chronicle and narrative text genres that the students discussed, along with several different activity genres, such as Initiation-Response-Evaluation, summarizing, dialogue, and different types of deliberations, were key factors in propelling the dialogic conversations forward or holding them back.

The framework approach taken in this study by McNeil and Pimentel (2010) is one of discourse in argumentation. The researchers were concerned with the role of the teacher in promoting argumentation in terms of both the argument structure and dialogic interactions in classroom discourse. The study was conducted in a junior/senior urban ecology class, focusing on the first lesson of Module 2, global climate change. The students watched three video clips and were then prompted to write an argument response about climate change and share with the class. Data were collected in the form of transcripts of student and teacher utterances from three teachers' classrooms. The transcripts were analyzed and coded for trends in the patterns of argumentative discourse and the role of the teacher in supporting that discourse. The researchers specifically coded for argument structure, dialogic interaction, and teacher questioning. The researchers found that between 19% and 35% of the discourse focused on scientific

argumentation, as students were using evidence and reasoning to justify their arguments. However, only one teacher's classroom discourse was largely made up of student-to-student dialogic interactions. The teacher used many open-ended questions to prompt evidence justification and student interaction, specifically student responses to other students' ideas and thinking as well as their own.

The focus of Reznitskaya and Gregory's study (2013) is dialogic teaching and learning in the classroom and how it is affected by sociocultural processes and how that in turn affects students' development. The researchers identify three outcomes of dialogic teaching, which are epistemological understanding, argument skills, and disciplinary knowledge. They then compare these outcomes with existing studies within the context of their research question. The outcome of the study showed that different sociocultural processes affect dialogic interactions in that it adds more depth to the discourse, as students may bring forth ideas born out of experience or observation that is unique to them. Additionally, that adds to the development of the individual student as well as the development of the class as a whole.

Sedova, Sedlacek, and Svaricek's study (2016) was concerned with dialogic teaching practice and teacher development. Their main question was centered on whether or not a teacher development program on dialogic interaction influenced student talk in the classroom and how it did so. Eight Czech teachers in lower secondary schools took part in a yearlong action-research teacher development program that was designed to train teachers in implementing dialogic teaching practices. Lessons were video-recorded before, during, and after the workshops. Audio recordings were also taken of teacher interviews and group discussions at the workshops. Additionally, students completed a questionnaire at the beginning and end of the program. The data were coded for student talk with reasoning, teachers' open questions of high cognitive

demand, teacher uptake, and open discussion. After the data were analyzed, it was determined that student talk was impacted by the teacher development program. The study showed that there was significant dialogic teaching and there was a higher proportion of student utterances with reasoning. It suggests that teachers can influence the nature of student talk if they are aware and choose to do so. Additionally, when students are talking with reasoning, they are actively involved in the dialogic co-construction of meaning.

Connections Across Studies

All of these studies provide guidance on how teachers can use teacher questioning to open up dialogic discourse in their classrooms. The studies that looked at different questioning styles determined that open-ended questioning promoted the most dialogic discourse. There was also a consensus among the studies that teacher input dialogic interactions is important.

Implications for Classroom Practice and Future Research

These studies, when examined as a whole, provide guidance as to how teachers can use teacher questioning to open up dialogic discourse in their classrooms. Teachers should also be aware of how frequently they are engaging in dynamic interactions with their students in their classrooms as well as what the intentions behind those interactions are. The research in this area of APCD must be more developed with non-question driven dialogic discourse in the classroom. What utterances can promote APCD without posing a question to the students? Dialogic discourse seems inherently tied to APCD and is an important piece to a rich learning environment.

Teacher Questioning

A second category, *teacher questioning*, involved research studies that shared the interactions of teacher questioning and APCD, as well as how they related to and affected one another.

Recent Studies

This first study conducted by Tienken, Goldberg, and DiRocco (2010) is centered around the cognitive disposition of questions asked to or directed at students. The researchers sought to examine the frequency that teachers used productive questioning in their lessons. They collected data from 98 certified teachers in grades three through twelve in 13 different schools across New York and New Jersey. Of the 98 teachers, 60 were experienced and 38 were novices. The questions that the teachers asked in the lessons were coded as either productive, meaning they involved higher order thinking, or reproductive, meaning they involved lower order thinking. A total of 2,363 questions were observed. The results showed that 32% of the questions asked by experienced teachers were productive, while 15% of the questions asked by novice teachers were productive. The data demonstrate that teachers were not taking advantage of the potential to challenge their students to use higher order thinking skills more frequently.

Boyd's study (2015) on questioning and classroom talk incorporated the idea of Student Critical Turns (SCTs), which she defines as "linguistically extended, socially engaged, and structurally coherent turns of student talk" (pg. 372). Her proposed hypothesis was that teacher questions can bring about more student talk and even enhance student talk to merit comprehension building and higher-order thinking. The study took place in a public elementary school in the southeastern United States, focusing on six students in a self-contained English Language Learning class. The students were from China, Pakistan, and Mexico. The researcher

examined two lessons taught at different times by the same teacher to the same participants in addition to post lesson interviews. Talk episodes within the lessons were coded as text based or text inspired, as well as for convergence or divergence. The data showed that the teacher extensively used contingent questions, “questions that build on, extend, or respond to previous contributions within three preceding student utterances” (pg. 379). Data also showed that the first set of lessons had the least SCTs while the last set of lessons had the most SCTs. The day with the least SCTs was correlated with text-based talk and the day with the most SCTs was correlated with text-inspired talk. Text-based talk consisted of students constructing meaning from the text, while text-inspired talk consisted of students discussing beyond the text and making connections to their lives. Additionally, most of the time that the teacher talked, she was asking a question, and most of the questions were contingent and convergent (e. g. focused on a specific aspect of what is being discussed). The results show that teacher questions affect student responses when they are in dialogue with one another and when the questions are divergent.

Franke, Webb, Chan, Ing, Freud, and Battey’s study (2009) was conducted to examine teachers in a large Southern California school district who had engaged in algebraic reasoning Cognitively Guided Instruction professional development and how that affected their questioning. They in turn looked at how the teacher questioning related to the students’ abilities to make explicit their complete and correct explanations of a problem. The teachers had been engaged in the professional development for more than a year, and the researchers focused on two second grade classrooms and one third grade classroom and the way that the teachers used questioning to help students display and extend their reasoning. The researchers videotaped and audiotaped the classroom conversations twice in one week for each classroom. They coded for

teacher questions that elicited individual student thinking and stimulated mathematical discussion. Additionally, the conversations were coded for two categories of student participation: accuracy of given answer and nature of explanation given.

The data showed that the teachers consistently asked the students to share and explain their thinking. The follow-up to the students' explanations varied. The follow up to the explanations included general questions, specific questions, and leading questions. Student responses to the follow-up varied as well. Students either went on to elaborate more on their thinking or failed to share a more complete explanation. The researchers concluded that follow-up questions after an explanation did not necessarily guarantee further elaboration. Only probing questions seemed to have a positive effect on student elaboration on a correct and complete answer. Overall, teacher questioning can provide students with the means necessary to relate to math in ways that support their understanding.

Connections Across Studies

The three studies examined on teacher questioning promoted the idea that teacher self-awareness when asking questions is important. They also suggested that teacher questioning does in fact have a large effect on student response. When examining student responses, the studies showed that there is way to predict how students will respond. Even though there were only three studies in this subset of studies, significant connections could be made between them.

Implications for Classroom Practice and Future Research

These three studies that focus on teacher questioning as a driving force behind APCD point to the idea that teacher awareness of the questions that they are asking is important to promoting APCD because the effects of teacher questioning were shown to be great. The studies also demonstrated that there is no set formula for question-and-response interactions. Students'

responses to teacher's questions, while a general category of response could potentially be predicted, are typically variable, as are teachers' follow-ups to those responses. Teachers must consider this when asking different types of questions so that they can guide the conversation where they desire it to go. More research on teacher follow-up may give insight into how teachers react to student responses and how in turn that follow-up can promote APCD. Teacher questioning within the parameters of APCD is an excellent resource for teachers to consider studying when reflecting on their classroom practice.

Student Collaboration

The next category identified focused on *student collaboration* in the context of APCD. These studies explored how student interaction and collaboration can promote APCD.

Recent Studies

The framework that Newman worked within in this study (2017) was the idea of educational linguistics and metatalk. She also worked within a framework for collaborative talk that included participating, understanding, and managing. Her research question focused on how teacher discourse shapes the development of students' collaborative dialogue. The study took place in a Secondary English classroom over the course of three weeks. Ten lessons were audio and video recorded and student written work was collected for data. The researcher examined the discourse of one of two teachers who implemented an intervention that emphasized the role of metatalk in developing students' collaborative talk. The data were coded in three categories: procedural talk, transmissive talk, and exploratory talk. The results showed that teachers engaged in more exploratory talk while students engaged in more collaborative talk. The teacher used the collaborative talk framework to model collaborative talk for the students, while also

using talk analysis activities to scaffold collaborative talk. The study showed that the teacher's role can be prominent in promoting and developing student collaborative talk.

Webb, Franke, De, Chan, Freund, Shein, and Melkonian's study (2009) on collaborative group work asked the question: "To what extent do teachers' instructional practices relate to small-group dialogue?" In order to answer the question, the researchers conducted a study in four 2nd and 3rd grade urban elementary math classrooms in Southern California. The students were predominantly Latino and were categorized as coming from low socioeconomic status backgrounds. There was a high population of English Language Learners, and the overall test scores were low. Video and audio recordings were taken of whole-class and small-group instruction. The researchers examined if, how, and how much the students were prompted to explain their thinking in small-group interventions as well as whole-class discussions in order to examine the relationship between teacher practice and student explanation and elaboration during collaborative group work. The data were coded for student and teacher participation and explanation. Teacher probing had the strongest relationship to student explanation in their small-groups. This answers the research question in the context of this particular classroom; certain instructional practices seem directly related to small-group dialogue.

The study conducted by Lin et al. (2015) focused on the effects of teacher scaffolding on collaborative reasoning and relational thinking. The researchers studied 120 4th grade students, six teachers, and ten discussions. The students had low to middle socioeconomic statuses. Video recordings were collected and coded for teacher scaffolding and student relational thinking. The teacher prompts for relational thinking had the most impact on student relational thinking and prompted even further relational thinking several talking turns later. Additionally, there were greater instances of students imitating other students' relational thinking than there

were of students imitating the teacher's relational thinking. The results emphasize the importance of the teacher's influence and role in student collaborative reasoning. According to the data, even a small amount of input from the teacher can have a great effect on student relational thinking.

Evans and Dawson's study (2017) investigated designed student response and productive whole class discussions. Their main research question considered how, in a new teacher's classroom, group discussions of designed student response problems might differ from group discussions of students' individually created responses. One novice teacher was videoed teaching six math problems to the same heterogeneous class of thirty 13 and 14-year-old students in a secondary classroom in the United Kingdom. The video clips were analyzed and the fourth, fifth, and sixth pairs of lessons were transcribed. Teacher questions and student contributions during the whole class discussions were coded. The largest percentage of teacher questioning in both designed student response and authentic student work discussions was descriptive. However, the range between the percentages in discussions of designed student response was smaller. There were more instances of explanatory and evaluative questioning in those discussions. Students contributed significantly more to discussions of designed student response problems. This is because when students are creating their own solutions, they do not have a clearly defined path to think along; they are creating the path step by step, and there may be some half steps or missteps along the way.

The focus of the study conducted by Hoffman and Mercer (2016) was collaborative problem solving. The researchers examined how teachers intervened in small group activities when the group encountered a problem. Ten math and two science teachers across eight secondary schools in southeast England were recorded. Data analysis shows that teachers

intervened in three situations: the group proposed no ideas, the group proposed incorrect ideas, or the group proposed correct ideas. In these situations, teachers used a variety of interactive strategies, such as authoritative, initiating, and continuing. In order to support students' thinking, teachers used strategies such as inviting students to speak, actively listening, and repeating ideas expressed by students. The specific strategies of making reference to ground rules, focusing students on the task, and inviting students to speak seemed to have the most positive impact on productive collaborative problem solving.

Gillies and Haynes' study (2011) focuses on cooperative learning, explanatory behavior, and problem solving and reasoning. Their research sought to determine whether or not teachers who implemented cooperative learning after having training in strategic questioning demonstrated more mediating verbal behavior than teachers who implemented cooperative learning without having been trained. They also sought to determine if students who had been trained in strategic questioning demonstrated more explanatory behavior and eventually more reasoning and problem-solving skills than students who had not been trained. In order to accomplish their goal, the researchers implemented a two-day workshop for all of the teachers on cooperative learning. Additional workshopping was held for the teachers in the cooperative learning + strategic questioning group. The teachers' cooperative learning lessons to a total of 615 students of mixed ability groups and mixed gender groups were then audiotaped and coded for demonstrating control, disciplining, mediating learning, encouraging, questioning, and maintaining learning. Students' verbal behavior was coded for elaborations, questions, short responses, engaging with others around the topic, and giving directions. The data showed that teachers in the cooperative learning + strategic questioning group used significantly more mediating behaviors than the teachers in the other group. The cooperative learning + strategic

questioning group also posed more questions that challenged the students to more higher order thinking. Additionally, that group had fewer disciplinary issues as well as more student elaboration and higher follow-up test scores. The results underscore the importance of the teacher actively supporting cooperative learning with strategic questioning and teaching students those strategies as well.

Connections Across Studies

Within these studies, it was clear that if a teacher desires to promote student APCD, they must intervene and/or model in some way before the student is able to take control of promoting APCD. Multiple studies showed that teacher probing or prompting for elaboration and collaborative reasoning yielded the greatest results.

Implications for Classroom Practice and Future Research

The studies demonstrated that teacher involvement and modeling for student collaborative learning is an important step in promoting student APCD. Initial teacher involvement allows for scaffolding and modeling, which then allows the teacher to turn the class over to the students at a certain point. Once students themselves are using APCD, they become autonomous learners as a class, as they can model the strategies for each other, cutting out the dependence on the teacher for such activities. More research may be done on the effectiveness of student collaboration in small groups versus in whole-class discussions and how that affects the frequency of APCD. Student-promoted APCD is important if teachers want a student-centered classroom.

Strategic Talk Moves

Another category, *strategic talk moves*, focused on specific classroom strategies that teachers might use to promote APCD. These strategies lent themselves to classroom practice, though many of them were grounded in established educational framework.

Recent Studies

The study conducted by Makar and Allmond (2018) was intended to provide guidance on the development of classroom talk over the course of a year using four classroom strategies. The researchers focused on two skills to improve: active listening and justifying/explaining to peers. The study took place in a Year 4 classroom in Australia and the four strategies that the teacher implemented were: building language structures around expectations, reinforcing positive examples, practicing norms, and reminders of expected norms. After a year of implementing these strategies, the teacher had achieved the goal set at the beginning of the year. The students were actively listening and justifying their ideas as well as beginning to engage with each other's ideas critically. The results of the study showed that the strategies implemented by the teacher were effective in improving the skills that the researchers set out to improve.

The study conducted by Herbel-Eisenmann, Drake, and Cirillo (2009) focused on the concept of revoicing, which has been defined as “the reuttering of another person's speech through repetition, expansion, rephrasing, and reporting” (Herbel-Eisenmann et. al. 268). The researchers' goal was to better understand how doing action research on their own classroom discourse impacts math teacher-researchers' beliefs and classroom practices. The study involved eight middle grades math teachers from seven Midwestern states, one university professor, and two United States graduate students. Transcripts from 18 project meetings were taken to understand how the teachers talked about revoicing as well as how their ideas of revoicing

changed over time. According to the data, the teacher-researchers viewed revoicing as more of an academic topic. Later on, they viewed it as more of a practical classroom strategy, based on the transcripts of their discussions. They eventually discussed turning theory into practice and began talking about how they could use revoicing in their classrooms. The conversations that the teacher-researchers had pointed toward the idea that the concept of revoicing is potentially more complex than much of the literature makes it out to be, as the teacher-researchers slightly struggled with the idea of translating the theory over to practice at the beginning of their discussions. They had to break down the concept into specific strategies, such as repeating, restating, rephrasing, and expanding, before they could talk about using revoicing in the classroom. They then were able to discuss the various purposes for each type of revoicing and what they would accomplish in the classroom.

The concept that the researchers of this study, van de Pol, Volman, and Beishuizen (2011), focused on was contingent teaching. Contingent teaching is teaching that responds to the level that the student is on. In other words, the teaching shifts according to how much or how little the student is able to understand or do. The researchers surmised that the greater the teacher's contingency when teaching, the greater the variations in the scaffolding will be. The study examined three prevocational schools, specifically three middle school male social studies teachers. The teachers were observed for three lessons and interviewed once. The lessons were video-recorded, transcribed, and coded. The interactions were coded as contingent when it was clear that the teacher was using his knowledge of the students' understanding before trying to support their learning. According to the data, only 7% of all teacher interactions were contingent. Additionally, in contingent interactions, task instruction decreased and subject-

matter questioning increased. While there was little contingency among the three teachers, when it was present, it seemed beneficial for the scaffolding of students' knowledge and abilities.

Ferris's study (2014) focuses on revoicing and how revoicing supports learners. The researcher used data from Project Challenge and other studies to compile strategies for revoicing in the classroom. Teachers using revoicing provides a way to model thinking that is relevant to the students, as it is a twist on something that are already thinking. It also allows the students to either confirm or deny the teacher's understanding of student knowledge. When teachers have consistently been modeling revoicing, they can move on to directly teaching it to their students so students themselves can expand on their own thinking when working in a collaborative learning environment. More research may be done on how specifically revoicing may affect English Language learners or struggling learners.

O'Connor, Michaels, and Chapin's study (2015) of academically productive talk moves involved a collaboration of Chapin's "Project Challenge" study and O'Connor's desire to study academically productive classroom talk moves. Project Challenge was designed to identify fourth grade students with promising math skills and provide them with a challenging curriculum. O'Connor worked with Chapin to provide professional development for teachers on how to use previously identified academically productive talk moves. The study was conducted with 6th grade students who had been involved in Project Challenge for two years. Two three-day lessons were taught by the same teacher who had been the lead Project Challenge teacher at one point previously. The teacher would present the same lesson to two classes, one lesson with academically productive talk moves and one lesson without academically productive talk moves.

Each class would receive one lesson with academically productive talk moves and one lesson without. The academically productive talk moves included telling students to think with a

partner before sharing with the class, revoicing for understanding, and asking students to think critically about each other's ideas. The lessons with direct instruction included none of these strategies. The data demonstrate that the use of academically productive talk moves creates more talking in the classroom in general. The results of these lessons show that students benefited greatly from the lessons that included academically productive talk moves. Their performance on math tasks after the lessons with academically productive talk moves improved significantly as well. This study points to the idea that even small doses of academically productive classroom talk can lead to significant classroom benefits in the classroom.

Parsons' study (2017) focused on follow-up statements and intellectual talk. She investigated how instructors used follow-up statements to socialize students' use of intellectual talk in the classroom. The study was conducted at a large southeastern university and examined eight classroom meetings of freshman and senior seminar classes. The lessons were audio-recorded, transcribed, and then open-coded, clustered, and thematized. Four categories of follow-up statements emerged from the data: revoicing, contextualization, parallel elaboration, and assistive elaboration. Revoicing, according to the text, "restates students' ideas in different terms," while contextualization "connects students' ideas to conventional knowledge and broader perspective" (pg. 68). Parallel elaboration "extends students' thinking" and "repeats words used by the students" (pg. 68). With assistive elaboration, the student "requests the help of the instructor" and "the instructor grants assistance" (pg. 68). These four categories respectively extended students' ability to articulate, contextualize, and elaborate on their thinking and ideas.

Connections Across Studies

The largest connection across this group of studies was that revoicing is a commonly promoted strategy to enhance classroom discussions. Three of the studies referenced revoicing when discussing talk moves that deepen reasoning skills or further student elaboration. Follow-up statements also appeared to be an important strategic talk move that prompts for richer discussions and student explanations.

Implications for Classroom Practice and Future Research

As with the Student Collaboration studies, the studies in this category suggest that it is most beneficial for teachers to model, scaffold, and explicitly teach their students strategic talk moves and how to use them in order to promote APCD. The idea of revoicing also surfaces in multiple studies and presents itself as a strong practical classroom practice. Specific strategies that teachers may use include revoicing, contingent teaching, and follow-up elaboration. Future research may be done on different revoicing strategies and why they might be used in different situations.

Professional Development

This final category focused on the many ways that *professional development* can impact classroom use of APCD. These findings make suggestions as to how schools might want to spend their money when considering large group professional development for their teachers.

Recent Studies

Michaels and O'Connor (2015) focused their study on professional development for academically productive discussions and the Initiation-Response-Evaluation (IRE) talk move. The researchers helped create two professional development resources, Classroom Discussion in Mathematics and Talk Science that teach teachers how to use productive talk

moves in math and science classes respectively. They then catalogued and analyzed productive talk moves in K-6 math classrooms and 3-5 science classrooms in the United States after those teachers have participated in the professional development sessions using the researcher-created resources. The results of the Talk Science professional development resource indicate that talk moves to support reasoning and thinking were used the most by teachers, while talk moves that support sharing, expanding, and clarifying did not have much effect on those areas as they were already highly used by teachers. There was an increase in the frequency of talk moves that supported four goals, with the largest increase in talk moves that supported Goal 3, helping students deepen their reasoning.

The study conducted by Kiemer, Groschner, Pehmer, and Seidel (2015) focused on a classroom discourse intervention. The researchers investigated the idea of if a video-based teacher professional development intervention to support academically productive discourse improved student motivation and interest development over the course of a year. They focused on ten 9th grade German classrooms and their teachers. They compared an intervention group, comprised of six teachers who took part in a video-based professional development, to a control group, comprised of four teachers who took part in a traditional professional development. Data on teacher questioning and teacher feedback were compiled for each group and results showed that there was an increase in constructive teacher feedback perceived student autonomy, competence, and intrinsic learning motivation, as well as greater student interest from the intervention group. This suggests that the video-based professional development had greater success in prompting teachers to strategically use questioning and feedback to improve student motivation and interest development.

Van der Veen, van der Wilt, van Kruistum, van Oers, and Michaels' study (2017) on the MODEL2TALK professional development intervention focused on how teachers can promote young students' oral communicative competence through productive classroom talk. The study was conducted with 21 teachers and 469 students at 11 schools. The mean age of the students was five years. Twelve of the teachers had the intervention and nine of them did not. The productive talk tools that were included in the intervention were focused on sharing, expanding, and clarifying, listening to one another, reasoning, thinking together, and metacommunication. The teachers had six conversations about animals with their students and the researchers videoed the first and last of the six conversations. The students were individually tested on oral communicative abilities before and after the intervention and lessons. The results show that students' oral communicative abilities were significantly improved after the intervention. However, the intervention had no effect on student subject matter knowledge. Overall, the data support that the MODEL2TALK intervention was successful in improving students' oral communicative competence through productive classroom talk.

Connections Across Studies

The largest connection across the professional development studies were that three of the four were successful in training the teachers to use APCD in their classrooms. The one that was not successful did not have enough data to determine whether or not it was successful.

Implications for Classroom Practice and Future Research

The practical classroom applications of this study are that there is potential for teachers to obtain APCD-promoting strategies from professional development if given the opportunity to participate in APCD-promoting professional development. More research must be done on how to sustain the effects of the professional development and how to hold teachers accountable for

continuing their attempts at APCD. Perhaps studies on teacher motivation may give insight as to how administrations may do so.

Limitations

The study was limited by two factors: access to research being confined to university-based accounts and the many locations that the studies were taken from. The researcher was given access to a finite amount of material to search through when conducting the initial search for studies. Perhaps more studies could have been found with different databases and different search terms. Additionally, the locations that the studies were taken from and conducted in varied greatly. These locations included the United States, the United Kingdom, South Africa, the Czech Republic, and many locations across the United States. Because of the varying level of importance placed on education across these countries and locations, teacher and student motivation may have different effects on components of the studies. The quality and quantity of the teachers that participated in the studies was also variable. More focused studies could be conducted with fewer variables due to location.

Conclusion

To reiterate the framework of the study, APCD is discussion that propels a deeper academic conversation forward, as opposed to creating surface level conversations, halting the conversation, or moving the conversation in a circle. This limited analysis of 25 studies comprising this manuscript showed that the current field of research in APCD is rich in some areas but lacking in others. However, there are identified avenues across all these studies for further research as well as implications for classroom practice that emanated from the studies. Classroom implications across the five categories provided the following guidance for teachers: how to use questioning to open up dialogic discourse in their classrooms; how to be self-aware of

the questions they ask students to promote APCD; how to model strategies for student collaborative learning as an important step in promoting student APCD; how to explicitly teach students the strategic talk moves and how to use them; and what professional development resources schools may choose to buy, and how they might be effectively implemented in various content areas with different age groups. Five respective examples of practice for each classroom implication are as follows: using open-ended questions to deepen thinking, understanding student knowledge in order to ask contingent questions, inviting students to speak and focusing students on the task to model collaborative learning strategies, rephrasing a student answer back to the class to clarify the meaning, and considering whether or not a professional development program will have long-term effects.

Future research is necessary in all of the categories explored in this manuscript in order to continue growth in APCD research, but it is most necessary in the realms of teacher questioning and professional development as far as how to promote APCD. More research in teacher questioning is critical, as there are few other instructional strategies that are so widely used as teacher questioning. Additionally, more research in professional development is necessary, as professional development affects large groups of teachers at a time, allowing the potential for widespread influence of particular strategies and frameworks across a school or district.

The overall conclusion from this exploration is that teacher awareness is key in making informed decisions about classroom practices and promoting APCD. Teachers must be aware of their own instructional practice. They must first examine their objectives for a lesson and then determine what the best utterances to speak are in order to accomplish those objectives. Teachers must also be aware of their own students' prior knowledge. For example, if the teacher's objective for a lesson involves extending reasoning or thinking, but students do not

possess base knowledge of the material, then extending reasoning or thinking is impossible.

Before employing APCD, the teacher must diagnose student knowledge and create objectives as well as APCD strategies that meet the students where they are as learners.

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