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STUDENT TEACHER KNOWLEDGE AND ITS IMPACT ON TASK DESIGN

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Abstract. This study looked at how student teachers created and altered mathematical assignments using their pedagogical and subject-specific knowledge of mathematics. It also looked at the connection between instructor expertise and a task's cognitive requirements. The framework of Hill, Ball, and Schilling outlines many domains of knowledge in mathematics for instruction. The Stein, Smith, Henningsen, and Silver framework also characterizes the cognitive demands of mathematical tasks in research. Findings show that when student teachers lack the expertise in other areas, particularly subject matter expertise, required to accomplish specific educational tasks, they focus on knowledge of shared content. was shown. When the student's teacher changed the task, the cognitive demands of that task often decreased. These declines are often related to a lack of subject matter expertise.

Keywords: knowledge, student teacher, task.

Introduction. According to Stein, Remillard, and Smith, teachers' classroom behavior is indirectly impacted by their understanding of mathematical material. Although it has been difficult to show a direct connection between instructors' expertise and student accomplishment, some researchers have attempted. Although a connection has not yet been conclusively proven, it is likely that there is one because researchers are constantly looking for one. Research that sought to establish a direct link between teacher knowledge and student accomplishment has been unsuccessful, at least in part because it neglected to take teacher classroom activities into consideration. Global metrics were frequently utilized by researchers to evaluate knowledge, which divorced knowledge from actual instruction. Fennama and Franke reviewed the pertinent literature and provided a number of examples showing the flaws in basing mathematical understanding on the quantity of math courses taken. This strategy certainly accepted that arithmetic coursework provided imminent instructors with all the essential information for educating mathematics. Other thinks about have characterized the required scientific information for teaching concurring to the generally substance of the educational modules; so also, this approach tacitly accept that the as it were information required for instructing is that included in the curriculum, distorting the circumstance.

These strategies are further imperfect by their conception of information. The idea that information is an external question that can be obtained through exchange is inalienable within the era of lists 2 of substance to be known by preservice instructors. This conception of knowledge and the accompanying strategies, don't clarify the utilize and creation of knowledge in practice. In case we are to pick up distant better;a much better;a higher;a stronger;an improved a

stronger understanding of how instructors utilize their information within the act of educating, a diverse epistemological hypothesis and technique ought to be considered. Slope, Schilling, and Ball claimed that analysts ought to center on how teachers utilize their information instead of on amounts of had information. By focusing on how teachers apply information in several circumstances, analysts may learn how information impacts teachers' behaviors. In any case, numerous of the ponders centering on the utilize of instructor information in hone endeavor to look at a few perspectives of teacher practice at the same time: planning, instruction, evaluation and reflection. Such an approach to studying educator information may be useful; be that as it may, there have to be be more studies that look at as it were one viewpoint of instructing. Moreover, by exploring as it were one region of teacher hone, analysts can see at educator information in more noteworthy profundity. Hence, this study will center on the perspective of arrangement.

The National Chamber of Instructors of Arithmetic proposed the importance of posturing beneficial scientific assignments within the classroom. It has been suggested that the information instructors utilize to execute scientific assignments influences the cognitive requests of the errands. Furthermore, the cognitive request of a assignment impacts understudy learning. Looking at how educator information impacts the cognitive requests of a assignment may provide understanding approximately how instructor information impacts understudy learning. But, few studies have examined how teachers use their knowledge to design and modify math problems. This is an area of teacher practice that needs to be explored in conjunction with teacher knowledge. Therefore, this study examines the relationship between teacher knowledge and the design and modification of mathematical tasks. Stein et al. He argued that learning as a researcher is most pronounced in high-level assignments. In arrange to extend understudy learning, instructors ought to endeavor to execute high-level tasks. By looking at the association between instructor information and the cognitive requests of a task, analysts can way better depict the affect instructor information has on classroom practice. In considering instructor information, it is profitable to ponder not as it were how it is utilized, but how it might create. As such, it is critical to set up a pattern of teacher knowledge by considering understudy instructors. Understudy instructors may not have the same knowledge base as more experienced instructors. The inability of amateur instructors often means that they need information that experienced instructors might have. Thus understudy instructors will likely encounter more occurrences where they don't have the essential information. By inquiring about understudy instructors rather than practicing teachers, these occurrences will be more visit and allow the analyst to induce a better understanding of how information is utilized in planning and altering assignments as well as the impact information has on the cognitive requests of the assignments. An extra issue predominant within the inquire about is the wealth of research on elementary instructors instead of auxiliary science instructors. Indeed in studies examining both groups, it is troublesome to distinguish the conclusions drawn for the two distinctive bunches. The exchange of conclusions with respect to information and practice from basic to auxiliary instructors is risky since the bunches likely have diverse information bases due to contrasts in arrangement, preparing, and hone.

Research questions:

- How do student teachers use their knowledge to design or modify math problems?

- How female preservice math teachers use their knowledge to design or modify math problems?
- How male preservice math teachers use their knowledge to design of modify math problems?
- How did the student's teacher's knowledge influence the cognitive demands of the task?

Terms and methods of research. Considering both the results of research on mathematics teacher knowledge and the theoretical frameworks proposed for research on teacher knowledge, we describe the field of research in teacher knowledge. This chapter then devotes itself to the findings and framework conditions for studying mathematical tasks. The Synthesis of Two Fields of Study section describes some of the research that examines teacher knowledge and mathematical challenges, as well as the wealth of research potential from the synthesis of her two fields.

Research results. This study is part of a larger study of students teaching secondary mathematics at leading universities. The student-teacher program in this study contrasts with the traditional student-teacher model, where students and teachers are assigned to a supportive teacher and expected to learn how to teach by mimicking the teacher's behavior. incorporated aspects of the Japanese student model. It in turn uses aspects of Japanese language education. Student-teachers were divided into four groups. Each cluster was divided into her two pairs of student-teachers. Pairs were assigned to different cooperating teachers. During weeks 3-5 and 14 of the 15-week student teaching experience, each pair of students planned and taught one lesson. Each pair planned lessons together and taught separately in separate classes. A co-teacher, another member of the cluster, and a supervisor observed her two lessons conducted by a student-teacher pair. After class, observers and student-teachers discussed teaching experiences at a retrospective, and a protocol was developed to encourage student-teachers to take the lead in the discussion. This series of events is called an education/observation/reflection session. Both the lessons and the debriefing were videotaped for later analysis. Participants and sample In this study, we chose to examine student-teacher knowledge rather than actual teacher knowledge. in Hill et al. The author suggests that much of her KCS that teachers use is empirical rather than research-based. The student's teacher does not have much experience teaching mathematics with students and must rely on different knowledge domains to design and modify assignments than experienced teachers There are cases.

Participants and Instrument

My sample consisted of two third year student teachers, which are studying at Atyrau state university named after Kh.Dosmukhamedov and 56 seventh-grade students (all are female) from the Atyrau girls lyceum. These two students were given an algebra book and given a task to make a quiz for seventh grade students. The task of the summative assessment test was exponents. So, this is their variant of the quiz:

Good luck, do your best☺

Variant A

1) Write the following expressions in exponential form(20):

$x \cdot x \cdot x \cdot x =$

$\frac{4}{9} \cdot \frac{4}{9} \cdot \frac{4}{9} \cdot \frac{4}{9} \cdot \frac{4}{9} \cdot \frac{4}{9} =$

$(-a)\cdot(-a)\cdot(-a)\cdot(-a)\cdot(-a)\cdot(-a)\cdot(-a) =$

2) Calculate (20):

7^2

$(-1)^{13}$

$(-2)^3$

3) Evaluate(20):

$b\cdot b^4\cdot b^{-1} =$

$15^{7n+1}\cdot 15^{2n-1} =$

4) Calculate(20):

$\frac{8^{x+1}\cdot 8^{2-x}}{8^3} =$

$\frac{6^6+6^5+6^7}{6^3+6^5+6^4} =$

5) Find the last digit of number(20):

$568^{63} =$

Then**,** i gave them descriptor and some additional worksheets from kutasoftware. Gave them one week to do the task again. After one week, these two student teachers' work made me feel surprised.

Time needed: **20 min**

Variant A

1. **Find the value of the expression:** $\frac{3^7}{3^5}\cdot\left(3^2\right)^3 =$
2. **Reduce the algebraic equation:** $\left(\frac{n^{-4}}{4n^{-5}}\right)^{-2}\cdot 6n^6m^2 =$

3. The distance from the earth to the sun is 149500000000m.

a. Write the distance from the earth to the sun in standard form (in meters).
b. Write the distance from the earth to the sun in standard form (in km).

4. Given two numbers: $6,45\cdot 10^5$ **and** $4,5\cdot 10^4$

a. Add them and write in standard form
b. Subtract them and write in standard form

These are main criterias we need to pay attention when taking the exam: achievement of learning objectives, differentiated reading, applied questions, UBT questions. The difference between the two exams is that most of the criteria were met in the second exam. Of course, this is not a perfect variant, but we have seen that the fact that student teachers have a lot of information in the preparation of any material affects the design of tasks.

Conclusion. Earlier in this chapter, we discussed how student teachers can use their knowledge to design and modify tasks and plan how to integrate them into

their lessons. They often used him KCS, pedagogical knowledge, CCK. They occasionally used the KCT and little knowledge of the SCK and syllabus. Interestingly, the student's teacher used her CCK to predict student thinking. Similarly, the student's teacher used her CCK to create a mathematical explanation, interpret the student's solution, and identify the mathematical topic of the task. Cognitive demands of the task often changed when the student's teacher modified the task or incorporated it into the lesson plan. In most cases, the cognitive demands of the task decreased. Factors that explain these changes include expecting an explanation of the student's thought process, removing the mathematics connection from the task, giving the student the knowledge necessary to complete the task, and the developmental level of the student. is not considered intermediate level. These factors were associated with the student-teacher's lack of knowledge, usually her SCK.

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ОҚУШЫЛАР МЕН ОҚЫТУШЫЛАРДЫҢ БІЛІМІ ЖӘНЕ ОЛАРДЫҢ ТАПСЫРМАЛАРДЫ ӘЗІРЛЕУГЕ ӘСЕРІ

Аңдатпа. Бұл зерттеу мұғалім студенттердің математикадағы педагогикалық және пәндік білімдерін пайдалана отырып, математикалық тапсырмаларды қалай жасағанын және өзгерткенін зерттеді. Сондай-ақ нұсқаушы тәжірибесі мен тапсырманың когнитивтік талаптарының арасындағы байланыс қарастырылды. Оқуға

арналған математикалық білімнің көптеген салаларын сипаттайтын Hill, Ball және Schilling (2008) құрылымы, сондай-ақ математикалық есептердің когнитивтік талаптарын сипаттайтын Стейн, Смит, Хеннингсен және Сильвер құрылымы кеңінен келтірілген зерттеу (2000) жұмыстары.

Зерттеу нәтижелері көрсеткендей, мұғалім-студенттің басқа салаларда қажетті тәжірибесі, атап айтқанда мамандандырылған тақырыптар бойынша білімдері жетіспесе, олар белгілі бір оқу тапсырмасын орындау үшін жалпы мазмұнды білуге бет бұрды. Тапсырманы студент-мұғалімдер өзгерткен кезде, жұмыстың танымдық талаптары жиі төмендеді. Бұл қысқартулар көбінесе пән саласында тәжірибенің болмауына байланысты болды.

Тірек сөздер: білім, студент, оқытушы, тапсырма.

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ЗНАНИЕ МАТЕМАТИКИ УЧИТЕЛЕМ-УЧЕНИКОМ И ЕГО ВЛИЯНИЕ НА РАЗРАБОТКУ ЗАДАНИЙ

Аннотация. В этом исследовании изучалось, как ученики-учителя создавали и изменяли математические задания, используя свои педагогические и предметные знания по математике. Также рассматривалась связь между опытом инструктора и когнитивными требованиями задачи. Структура Хилла, Болла и Шиллинга (2008), которая описывает многие области математических знаний для обучения, а также структура Штейна, Смита, Хеннингсена и Сильвера, которая характеризует когнитивные требования математических задач, были широко процитированы в исследование (2000).

Результаты исследования показали, что, когда учителям-учащимся не хватало необходимого опыта в других областях, в частности знаний по специализированным темам, для выполнения конкретной учебной задачи, они обращались к своим знаниям общего содержания. Когда задание было изменено учениками-учителями, познавательные требования работы часто снижались. Эти сокращения часто были связаны с отсутствием опыта в предметной области.

Ключевые слова: знания, студент, преподаватель, задача.