Captions

(M10C)

Web-based Guided Practice to Improve Math Word Problem Solving

Ronald R. Kelly

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PROJECT SOLVE: Web-based Guided Practice to Improve Math Word Problem Solving

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>>SPEAKER: GOOD MORNING. WE ARE GOING TO GET STARTED SO WE CAN STAY

ON. I AM CARLA, I WILL BE FACILITATING THE SESSION. WE HAVE

INTERPRETERS, VALORY AND JOHN MARK AND WE HAVE CAPTIONING THIS MORNING,

JENNIFER IS DOING OUR CAPTIONING.

JUST A COUPLE ANNOUNCEMENTS BEFORE WE GET GOING. THERE HAS BEEN

ONE CANCELLATION TO THE SCHEDULE. THE SESSION AT 11:00 IN ROOM 2590,

PRESENTED BY CINDY KING HAS BEEN CANCELLED DUE TO AN EMERGENCY FOR THE

SPEAKER. SO THAT WILL NOT BE THIS MORNING AT 11.

I WOULD ALSO LIKE TO REMIND YOU THAT WE WOULD LIKE TO HAVE YOU

FILL OUT AN EVALUATION FORM FOR ALL OF THE SESSIONS. YOU CAN DO THIS

ON THE WEBSITE, ON THE SECOND FLOOR. THERE ARE A NUMBER OF COMPUTERS

IN THE LEARNING CENTER FOR YOUR USE. IF YOU PREFER TO HAVE A PAPER

COPY OF THE EVALUATION, YOU SHOULD HAVE SOME IN YOUR PACKETS BUT I HAVE

EXTRAS HERE. AND WE ASK THAT YOU JUST TURN THEM IN AT THE REGISTRATION

DESK LATER TODAY. IF ANYONE PREFERS THIS, I WILL HAVE THEM AVAILABLE

AT THE END OF THE SESSION.

WE DO HAVE A FEW MORE SEATS. OKAY. RATHER THAN TAKE UP ANY MORE

OF THE TIME WITH THE ANNOUNCEMENTS I WOULD LIKE TO INTRODUCE OUR FIRST

SPEAKER THIS IS RON KELLY FROM NATIONAL TECHNICAL INSTITUTE FOR THE

DEAF WORKS IN RESEARCH HERE AND HE WILL BE PRESENTING HIS TALK ON WEB

BASED GUIDED PRACTICE TO IMPROVE MATH WORD PROBLEM SOLVING.

TAKE IT AWAY RON.

>>RONALD KELLY: OKAY. I HAVE ABOUT A HALF HOUR PRESENTATION AND THEN

WE WILL HAVE TIMES FOR QUESTIONS. I ALSO HAVE COPIES OF MY POWERPOINT

ROUGH ASCII

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PRESENTATION AND COPIES OF THE PAPER, BOTH WILL BE AVAILABLE ON THE

WEBSITE AT THE END OF THE CONFERENCE. SO IF YOU DIDN'T GET A COPY ON

THE WAY OUT WE WILL PUT THEM BACK HERE AND YOU CAN TAKE THEM.

WE HAVE A PROJECT HERE. FUNDED BY FIPSE. AND THERE'S THREE OF US

ARE PRIMARILY INVOLVED IN IT. I WAS THINKING THAT HARRY LANG WAS GOING

TO BE HERE TODAY. MAYBE HE WILL SHOW UP IN A MINUTE.

KEITH MOUSELY IS NOT HERE. HE IS IN MASSACHUSETTS RIGHT NOW AT A

SEMINAR REGARDING ENHANCING WOMEN AND MATHEMATICS, COLLEGE STUDENTS,

DEAF AND HARD OF HEARING. SO I GUESS I AM HERE ALONE UNLESS HARRY

SHOWS UP.

WE HAVE HAD THIS PROJECT FOR ABOUT 7 MONTHS. SO WHAT YOU ARE

GOING TO SEE ON THE WEB IS A PROTOTYPE. WE HOPE TO HAVE IT FULLY

OPERATIONAL IN THE FALL.

YOU CAN SEE THE PEOPLE INVOLVED. WE ALSO HAVE AN EXTERNAL

EVALUATOR, MARKS KODASTA. WE HAVE AN ADVISORY GROUP CONCEPTUALIZING

IT.

OUR GOALS ARE AS FOLLOWS: OUR HOPE IS TO ABIDE A PRACTICE

ENVIRONMENT FOR DEAF STUDENTS TO DO WORD PROBLEMS. IN A MINUTE I WILL

SHOW YOU SOME OF THE PROBLEMS DEAF STUDENTS HAVE WITH WORD PROBLEMS.

ONE OF THE ADVANTAGES OF THIS PARTICULAR WEBSITE AS WE CONCEPTUALIZED

IT IS WE WOULD HAVE A DATA BASE TO EVALUATE THE STUDENTS. IF YOU GO TO

ANY WEBSITE TODAY FOR MATH, AND THERE'S 153,000 OF THEM. IF YOU HAVE

SOME KIND OF HINT OR HELP TO LEARN MATHEMATICS THERE IS ACTUALLY NO

DATA BASE ASSOCIATED WITH IT. A STUDENT OR WHOEVER GETS ON AND THEY

PLAY WITH IT. THEY GIVE THEM SUGGESTIONS AND THAT'S IT.

ROUGH ASCII

IN THIS CASE WE HOPE TO HOLD THE STUDENTS AND TIE INTO THEIR

CLASSROOMS FOR HOMEWORK AND SO FORTH. AND THEN WE WILL STORE ALL OF

THEIR PERFORMANCE AS THEY GO THROUGH THE WEBSITE, AND BE ABLE TO

PROVIDE THAT FEEDBACK TO TEACHERS AS WELL AS HAVE AN AGGREGATE DATA

BASE ON PROBLEM SOLVING OF DEAF STUDENTS.

WHICH I THINK IS A UNIQUE FEATURE OF THIS PARTICULAR WEBSITE. WE

ARE GOING TO PROVIDE INSTRUCTION AND STRATEGIES AS A PART OF THE

WEBSITE. IT WILL PROVIDE TEACHER BACKGROUND. PROBABLY OVER 80 PERCENT

OF THE TEACHERS TEACHING DEAF STUDENTS IN THIS COUNTRY DO NOT HAVE A

BACKGROUND IN MATHEMATICS. OR SCIENCE. THIS IS PRETTY CONSISTENT BY

THE WAY IN REGULAR EDUCATION PROGRAMS ALSO. SO IT'S JUST NOT UNIQUE TO

DEAF EDUCATION.

BUT WE WILL HAVE SOME BACKGROUND INFORMATION AND SHOW THEM HOW TO

USE THE WEB PAGE AND INTEGRATE IT WITH THEIR CLASSROOM WORK.

AND THEN OF COURSE WE HOPE TO AUDIT MARKET AND DISSEMINATE IT TO

RELEVANT AUDIENCES. AND WE ALSO EXPANDED IT TO LD STUDENTS. STUDENTS

WHO HAVE READING AND MATHEMATICS DISABILITIES.

I WILL GO OVER THIS QUICKLY. BASICALLY A PROBLEM IS WHEN YOU READ

SOMETHING OR SEE SOMETHING AND YOU DON'T KNOW IMMEDIATELY WHAT SERIES

OF ACTIONS TO TAKE. WHENEVER THERE'S A GAP BETWEEN WHERE YOU ARE NOW,

AND WHERE YOU WANT TO BE.

NOW LET ME EXPLAIN SOMETHING. THERE'S TWO KINDS OF MATH PROBLEMS

OR ANY KIND -- I GUESS ANY KIND OF PROBLEM. THERE'S TWO KINDS.

EXERCISES. AND TRUE PROBLEMS. EXERCISES ARE WHAT WE DO A LOT IN

EDUCATION. YOU TEACH A FORMULA. YOU TEACH AN ALGORITHM. YOU TEACH

SOME SORT OF PROCEDURE AND THEN YOU GIVE STUDENTS PROBLEMS AND IF THEY

CAN MATCH WHAT YOU TAUGHT TO WHAT THE PROBLEM IS, THEY CAN SOLVE THE

PROBLEM. AND THOSE ARE VERY COMMON IN THE SCHOOLS. AND THEY ARE

CALLED EXERCISES IN SOME PEOPLE'S. MOST OF US CALL THEM PROBLEMS. BUT

THEY ARE REALLY EXERCISES. YOU TEACH SOMETHING AND SEE IF THEY CAN

MATCH IT.

TRUE PROBLEM SOLVING HOWEVER IS MUCH MORE COMPLICATED. IT

REQUIRES A BACKGROUND, A LOT OF IN-DEPTH INFORMATION. YOU LOOK AT -- I

SEE TRUE PROBLEMS, I CAN SIT THERE FOR HALF A DAY. WHO COULD DO THIS?

SO WE ARE GOING TO HAVE BOTH ON THE WEBSITE. BUT EVERYTHING I

SHOW YOU TODAY WILL BE EXERCISES. AND AS WE GO DOWN THE ROW WE HOPE TO

ADD TRUE PROBLEM SOLVING TO THIS PARTICULAR WEBSITE.

IT LITERALLY IS INFINITE. WE CAN KEEP ADDING PROBLEMS UNTIL WE

RETIRE. WHICH I HOPE ISN'T TOMORROW.

SO ANY WAY TRUE PROBLEMS OR EXERCISES. THE KIND OF ERRORS THAT

STUDENTS HAVE IN PROBLEM SOLVING, I WILL TALK PRIMARILY ABOUT WORD

PROBLEM SOLVING. AND I WILL SHOW YOU WHY.

IS PEOPLE ARE INACCURATE IN WHAT THEY READ. THIS IS A COMMON

PROBLEM FOR ALL STUDENTS. ALL STUDENTS.

THEY READ TOO FAST. THEY MISS WORDS. THEY DON'T EVEN REREAD IT.

THEN THEY THINK, OH, I KNOW AND THEY LEAP FORWARD.

THEY HAVE INACCURACY IN THINKING. MANY STUDENTS PREFER TO GET IT

DONE QUICKLY, MOVE ON, MOVE ON, MOVE ON.

THEY DON'T HAVE CARE IN PERFORMING THE OPERATIONS. THEY ARE NOT

CONSISTENT INTERPRETING WORDS THAT MEANS ONE THING HERE AND THEY

ROUGH ASCII

INTERPRET IT A DIFFERENT WAY. AND SO FORTH.

THEY ARE NOT ACTIVE IN PROBLEM SOLVING. THEY DON'T BREAK IT INTO

PARTS THERE. ARE WHOLE LISTS OF ISSUES THAT EVERYONE IS CONFRONTED WITH

IN PROBLEM SOLVING. AND WORD PROBLEM SOLVING IS WORSE THAN GETTING --

NUMERIC GRAPHIC FORM.

LACK OF PERSEVERANCE IS A VERY LARGE PROBLEM WITH DEAF STUDENTS.

HERE AT N.T.I.D. AND WHEREVER WE LOOK AT THE DATA.

SO IF YOU LOOK AT HEARING SUBJECTS AND DEAF SUBJECTS, PRETTY MUCH

THEY HAVE THE SAME PROBLEMS. BUT FOR DEAF, WE HAVE SOME OTHER THINGS.

WE HAVE READING COMPREHENSION ISSUES. WE HAVE GOAL MONITORING. AND

THAT IS THEY DON'T SEE ALL THE STEPS AND THEY ONLY DO PART OF THE

STEPS. AND OF COURSE WE HAVE LANGUAGE RELATED ERRORS AND THAT'S

REVERSE RELATED TO A SPECIFIC STUDY WE HAVE DONE THIS PAST YEAR. WHAT

THAT MEANS IS IN TERMS OF LANGUAGE THEY INTERPRET IT ONE WAY WHEN IN

FACT THEY REVERSE THE MEANING. AND OF COURSE WE HAVE BIG PROBLEM

INACCURACY OF CALCULATION AND SO FORTH.

WE DID A STUDY TO TELL A PROBLEM AND ALL OF THESE ARE COLLEGE

STUDENTS HERE AT N.T.I.D.. WE DID A STUDY WHERE WE GAVE THEM 15

PROBLEMS. IN AM NUMERIC GRAPHIC FORM LIKE THIS.

THAT IS THEY GOT A GRAPHIC, AND THEN THEY WERE CONDUCTED THE

DIMENSIONS ON THE GRAPHIC AND THEN CALCULATE THE AREA.

OF COURSE WE HAVE THREE SETS. SIMPLE, A LITTLE MORE COMPLEX WHERE

THEY HAD TO ADD OR SUBTRACT SOMETHING AND THEN THREE DIMENSIONAL.

IF YOU LOOK AT THIS TABLE HERE, BASICALLY THEY PERFORMED EQUALLY

WITH HEARING COLLEGE STUDENTS. ON ALL OF THESE. THE EASIEST, THE NEXT

ROUGH ASCII

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COMPLICATED AND THE MORE COMPLICATED. THESE ARE MEANS OUT OF 5.

SO FOR THE EASIEST THEY ALL GOT THEM RIGHT. THESE ARE THE HEARING

STUDENTS OKAY?

AND IF YOU ADD ALL OF THESE UP, THERE'S NO STATISTICAL DIFFERENCE

BETWEEN ANY OF THESE. BASICALLY ALL THE STUDENTS WITH THE GRAPHIC

NUMERIC INFORMATION PERFORMED EQUALLY.

ARE YOU WITH ME ON THAT?

WE THEN TOOK THESE PROBLEMS AND MADE WORD PROBLEMS. LITERALLY THE

SAME PROBLEM ONLY THEY WERE WORD PROBLEMS. WE ALREADY HAD EVIDENCE

THEY COULD DO THE MATH. THEY HAD THE SKILL. EVERYTHING.

THE WORD PROBLEMS WERE REALLY IN THE RANGE FROM 4 TO 6 GRADE LEVEL

IN TERMS OF GRAMMAR, IN TERMS OF READABILITY.

SO WHAT WE DID IS WE TOOK IT AND NO COMPLICATED LANGUAGE, WE TOOK

AND SET A RECTANGLE MEASURES. FIND THE AREA. SO THE READING -- ALL

THE READING ABILITIES WERE IN THE RANGE OF THESE PROBLEMS.

WHAT DO YOU THINK HAPPENED?

RIGHT OUT OF SIGHT. IF YOU LOOK AT THE MEAN, HERE THE EASY ONES

THEY GOT. BUT THE MINUTE YOU GO TO THE NEXT STEP OR THERE WERE TWO

KIND OF INFORMATION THEY HAD TO ADD OR SUBTRACT, OR YOU HAD A THREE

DIMENSIONS, THE DEAF STUDENTS WENT OUT OF SIGHT.

THE HEARING STUDENTS WENT DOWN TOO BY THE WAY. EASY AND A FEW

THEY RUSHED THROUGH IT AND MADE A LITTLE MISTAKE. BUT OVER ALL THEIR

PERFORMANCE WAS IDENTICAL TO THE PREVIOUS PERFORMANCE. THE MEAN WAS

THE SAME AND THESE SLOPED ABOUT THE SAME.

THE DEAF STUDENTS EVEN THOUGH HALF AN HOUR EARLIER THEY SHOWED

ROUGH ASCII

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THEY HAD THE SKILL TO DO ALL OF THOSE PROBLEMS. THEY LITERALLY TANKED.

THESE ARE COLLEGE STUDENTS. AND THEY SAID THINGS LIKE "OH, WE

CAN'T DO WORD PROBLEMS. WORD PROBLEMS FRIGHTEN ME. WORD PROBLEMS

COMPLICATED."YOU KNOW WHEN WE STARTED THE STUDY I WAS EMBARRASSED. YOU

CAN SEE THE MEANS HERE.

SO ALL THE DEAF PERFORMED SIGNIFICANTLY DIFFERENT FROM THE HEARING

STUDENTS ON WORD PROBLEMS EVEN THOUGH THEY WERE COMPARABLE ON THEM.

SO WE THINK THERE IS A SERIOUS ISSUE WE HAVE TO DEAL WITH.

THAT'S JUST A GRAPH. THE HEARING ARE AT THE TOP AND THE DEAF YOU

CAN SEE AT THE BOTTOM.

THEY ALL WENT DOWN, BUT SIGNIFICANTLY LOWER.

WHAT THE LITERATURE SAYS IS EVERYONE SHOULD HAVE PRACTICED A

GENERAL PROBLEM SOLVING STRATEGIES. APPLY LEARNED KNOWLEDGE. SOMEONE

HAS TO TEACH IT TO YOU. PRACTICE AND REPRESENTING DIFFERENT PROBLEM

SITUATIONS. PRACTICE WITH A VARIETY OF PROBLEM SITUATIONS. PRACTICE

WITH EXERCISES AND TRUE PROBLEM SOLVING. WE ARE SHOWING EVEN OUR

STUDENTS DON'T HAVE SUFFICIENT PRACTICE WITH WORD PROBLEM EXERCISES.

EVALUATING YOUR ANSWER IN TERMS OF REASONNESS. DID YOU COME UP

WITH SOMETHING THAT EVEN LOOKS APPROPRIATE?

AND OF COURSE DEVELOPING DEPTH AND BREADTH IN CONTENT LIMIT. WE

EXPECT DO THIS ON THAT BUT WE TRIED TO INCORPORATE ALL OF THESE

PRINCIPLES INTO THE WEBSITE YOU ARE ABOUT TO SEE.

IT LOOKS SOMETHING LIKE THIS.

I AM GOING TO GO LIVE HERE TO THE WEBSITE. KEEP IN MIND THIS IS A

PROTOTYPE. WE HAVE ONLY BEEN UP ABOUT 7 MONTHS.

ROUGH ASCII

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WE HOPE TO HAVE THIS COMPLETELY REVISED BASED ON DATA WE HAVE

COLLECTED FROM 18 DEAF STUDENTS ALREADY. AND SO IT'S GOING TO LOOK

DIFFERENT.

BUT THIS WILL GIVE YOU AN IDEA CONCEPTUALLY WHAT WE ARE TRYING TO

DO.

LET ME CLOSE THIS DOWN. UM LET ME BACK UP SINCE I WANT TO STAY ON

TIME.

I WON'T CLOSE THIS DOWN. LET ME ENDS IT WITH A COUPLE OF SLIDES.

YOU ARE WONDERING WHERE WE GET THE MATH PROBLEMS. WELL WE -- OUR

ADVISORY GROUP HAD A LENGTHY DISCUSSION ABOUT THIS. AND WHAT WE ARE

LOOKING AT ARE TYPICAL MATH TEXT FOR COLLEGE STUDENTS. GETTING THE

KINDS OF PROBLEMS YOU WOULD SEE.

WE ARE ALSO LOOKING AT THE ACT AND SAT, TO GET IN N.T.I.D. YOU

HAVE TO DO THE ACT. TO GO ANYWHERE YOU MIGHT HAVE TO DO BOTH.

SO WE ARE TAKING WORD PROBLEMS FROM THESE SOURCES. SO STUDENTS

HAVE A DIRECT CONNECTION AND BENEFIT IN KNOWING THAT THEY PRACTICE

THESE, THEY INCREASE THEIR AVAILABILITY AND POTENTIAL TO GET INTO

COLLEGE.

AND THE KINDS OF PROBLEMS WE WILL STICK TO ARE ALGEBRA, BUT THERE

IS ARITHMETIC YOU HAVE TO KNOW TO DO THE ALGEBRA. WE ARE LOOKING AT

RATIO PROPORTIONS, PERCENTS, AVERAGES AND OTHERS AND THOSE ALGEBRA

AREAS.

LET'S SEE IF THE SERVER IS UP. ALGEBRA.

THE WEBSITE, THEY JUST CHANGED SERVERS HERE AT R.I.T. LAST WEEK.

WHAT POOR TIMING.

ROUGH ASCII

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IF YOU COME TO THIS YOU CAN GET A DESCRIPTION OF THE PROJECT. YOU

CAN SEE THE STAFF INVOLVED. IF YOU WANT TO KNOW MORE ABOUT THE TWO

PRIMARY INVESTIGATORS, YOU CAN GO AND -- I WILL INTRODUCE HARRY HERE.

DID HARRY COME?

OKAY. LET ME GO BACK.

SO THERE ARE THINGS WORKING. IF YOU WANT TO SEND US E-MAIL YOU

CAN DO THAT. WHAT ISN'T WORKING IS -- WE ARE WORKING ON THE TEACHER

INFORMATION. WE ARE WORKING ON THE STUDENT INFORMATION. THAT'S

SCHEDULED FOR THE SUMMER.

BUT WE DO HAVE SOME PROBLEMS AS EXAMPLES THAT WILL GIVE YOU AN

IDEA OF THE HELP AND THE GUIDELINES WE ARE GOING THROUGH.

AM I GOING OKAY, JOHN?

LET ME GIVE YOU AN EXAMPLE? YOU MIGHT SEE MOST PROBLEMS ARE NOT

THIS LONG BUT WE TRY TO INCORPORATE EVERYTHING INTO THIS PROBLEM.

SOME OF OUR DEAF STUDENTS IF THEY SAW THIS, AND SAID WHAT'S THE

PROBLEM GOAL THEY WOULD SAY BILL AND JULIE WANT TO BUILD A TOOL SHED.

OF COURSE THAT ISN'T THE GOAL OF THE PROBLEM.

WE HAVE A HELP MENU. WHEN THEY SEE THE PROBLEM, I DIDN'T NOTICE

THAT WASN'T SHOWING.

WE HAVE A HELP MENU. AND RELATED TO GENERAL PROBLEM SOLVING, WE

HAVE THIS KIND OF INFORMATION AVAILABLE. AND FOR SPECIFIC CONTENT

REMINDERS WE HAVE THIS KIND OF INFORMATION.

SO IF YOU COME IN AND LOOKED AT THIS AND I WILL JUST GO DOWN THIS.

PROBLEM GOAL. THEY LITERALLY SEE THIS AND THEY CAN PUT IN AND IF

THEY SAY, THAT'S THE PROBLEM GOAL. IT WILL GIVE THEM FEEDBACK THAT

SAYS, NO I DON'T THINK SO.

BY THE WAY, WE TRIED TO KEEP EVERYTHING SIMPLE. IF THIS DOESN'T

LOOK JAZZY, IT'S BECAUSE WE WANT IT TO LOAD FAST. AND IF PEOPLE ARE ON

MODEMS WE DON'T WANT THEM WAITING AND WAITING UNTIL THE FANTASTIC

GRAPHICS. SO EVERYTHING IS SIMPLE. CLEAR AND IT'S -- YOU KIND OF WANT

A WIZARD ON THEIR SHOULDER. THEY SAY OH, MAYBE YOU BETTER DO THIS.

NOW THERE ARE SOME THINGS WE CAN'T DO. BUT IF THEY COME DOWN

HERE. AND SAY THIS. THEY GET FEEDBACK.

WE ALSO HAVE WORDS DEFINED. SO WE ARE WORKING ON THIS. BUT THEY

GET DEFINITIONS THAT POP UP. AND PARTLY WE ARE USING OUR RESEARCH AND

OUR FIELD TESTING TO GIVE US THE IDEA OF THE KIND OF WORDS STUDENT

NEED.

ONE OF THE BEAUTIES OF THIS WEBSITE IS WE HOPE TO DEVELOP WORKING

RELATIONSHIPS WITH TEACHERS IN THE FIELD. AND THEY CAN DO TWO THINGS.

THEY CAN SUGGEST PROBLEMS TO BE ADDED TO THE POOL. OR THEY COULD SAY I

WANT MY STUDENTS TO WORK ON FRACTIONS OR SOME OTHER CATEGORY OF WORD

PROBLEMS.

AND WE CAN SET IT UP WHERE THEIR STUDENTS COME IN AND ONLY LOOK AT

THOSE PROBLEMS.

THIS IS DESIGNED NOT TO REPLACE CLASSROOM TEACHING. THIS IS

DESIGNED TO BE A SUPPLEMENT AND IF YOU WANT TO GIVE YOUR STUDENTS

PRACTICE WITHOUT CHANGING YOUR COURSE, YOU HAVE A RESOURCE LIKE TO HELP

YOU.

SO WE DO HAVE THIS HELP.

WE ALSO GIVE THEM INFORMATION NEEDED TO CALCULATE IT. YOU HAVE TO

ROUGH ASCII

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HAVE ALL OF THIS TO CALCULATE THE PROBLEM.

WE CAN GIVE THEM DIMENSIONS OF THE SHED IF THEY DON'T WANT TO LAY

IT OUT.

HOW TO FIND THE AREA OF A TRIANGLE. SEE WHEN YOU SIT DOWN AND YOU

DO A PROBLEM. YOU HAVE TO SAY, OH, HAVE I SEEN SOMETHING LIKE THIS

BEFORE?

AND IF YOU DON'T SAY THAT, YOU MIGHT WANT TO AS I THEY LOOK AT

THIS AND SAY, OH, MAYBE I NEED TO KNOW HOW TO CALCULATE THE AREA OF A

TRIANGLE.

WE ARE NOT TEACHING THEM HOW TO CALCULATE THE AREA OF A TRIANGLE.

WE ARE REMINDING THEM SOMEWHERE THEY LEARNED IT AND HERE IS WHAT THE

HEIGHT TIMES BASE TIMES ONE-HALF OKAY.

SO IN EVERY PROBLEM, WE HAVE HAS UNIQUE CHARACTERISTICS IN TERMS

OF GENERAL PROBLEM SOLVING, GOING THROUGH. AND THEN SPECIFIC CONTENT

THEY NEED TO BRING TO THEM.

OKAY? WE ARE ACTUALLY PRETTY EXCITED ABOUT THIS BECAUSE WE TESTED

IT WITH FIELD TESTED IT WITH 18 DEAF STUDENTS. HALF OF THEM WERE IN

THE COLLEGE OF SCIENCE. SO THEY ARE VERY HIGH SKILLED. NOW EVEN

THOUGH THEY ARE HIGH SKILLS AND THEY MATRICULATED AT ANOTHER COLLEGE OF

ROCHESTER INSTITUTE OF TECHNOLOGY. A LOT OF THEM MISSED A THIRD TO

HALF. EVEN THOUGH THEY FELT THEY WERE EASY THEY STILL DIDN'T HAVE --

AND YET THEN WE DID N.T.I.D. STUDENTS TWO HAVE A NOTCH DOWN. THEY ARE

WORKING ON TWO-YEAR DEGREES. THEY HAD A LITTLE MORE DIFFICULTY WITH

IT.

BUT ALL THE STUDENTS COULD USE REFRESHERS. AND SOME OF THE

ROUGH ASCII

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COLLEGE OF SCIENCE STUDENTS SAID, YOU KNOW WHY I LIKE THIS? BECAUSE I

CAN GET THE INFORMATION I WANT. IF I GO SIT WITH A TUTOR, SOMETIMES

THE TUTOR TAKES ME DOWN ANOTHER PATH.

AND I DON'T HAVE ANY CONTROL OVER IT.

YOU SIT DOWN WITH A TUTOR, THE TUTOR HAS THEIR OBJECTIVES TOO.

SO, THIS IS THE KIND OF HELP WE ARE TRYING TO PROVIDE. LET ME GO

TO ANOTHER PROBLEM.

LET'S DO RUNNING TRACK. WE ARE STILL WORKING ON THIS.

LET ME SEE IF I CAN PRODUCE THAT.

SO, THIS IS STILL A PROTOTYPE WE HOPE TO HAVE THESE PLACED MORE

APPROPRIATELY. IN THIS CASE, WE GIVE HOW TO CALCULATE A CIRCUMFERENCE

OF A CIRCLE.

HOW TO ORGANIZE THE INFORMATION TO SOLVE THE PROBLEM.

SO, SEE HOW QUICK IT COMES UP? NOW THIS IS ON ETHER NET BUT ON A

MODE AM IT IS ALMOST AS QUICK. EVERYTHING IS NOT A LOT OF GRAPHICS

THAT TAKE A LOT TO LOAD. WE ARE TRYING TO BE SENSITIVE. NO ONE WANTS

TO WAIT AND WAIT WHILE THE BROWSER GRINDS AWAY.

AM I GOING TOO FAST?

HERE'S AN INTERESTING PROBLEM. SEE THIS PROBLEM. THERE'S A COMMA

HERE AND HERE.

NOW IF WE GO BACK AND LOOK AT THIS PROBLEM, THE COMMA IS NOT AFTER

THE 7, IT'S AFTER HERE.

SO, JUST A LITTLE PLACEMENT OF A COMMA WILL CONFUSE EVERYBODY BUT

PARTICULARLY DEAF STUDENTS. SO WE ARE TRYING TO GIVE CONTRAST. SAME

WORDING, AND IN THIS CASE, BOTH OF THESE PROBLEMS ARE ABOUT THE SAME, I

GUESS.

LET'S SEE WHAT WAS I LOOKING FOR?

DID I JUST CLICK ON THAT?

HERE WE ARE GIVING THEM NOW THE FORMULA AND THEY CAN OF COURSE

CLICK TO SEE WHICH IS CORRECT.

OKAY?

THAT IN A NUTSHELL -- IT'S 10:30 AND I'M ALMOST DONE.

LET ME JUST CLOSE THIS. HIDE NETSCAPE.

NOW THIS WON'T TAKE ME BACK TO WHERE I WANT TO BE.

I GUESS I WILL JUST -- MY LAST TWO SLIDES.

IT'S CURRENTLY UNDER REVISION. IF YOU GO TO IT YOU WILL SEE

THINGS AREN'T COMPLETE. WE HAVE BEEN WORKING NIGHT AND DAY -- THE LAST

7 MONTHS SCRAMBLING TO GET ALL OF THIS DONE.

WE ARE HOPING TO HAVE IT UP AND RUNNING. HERE'S THE URL. HERE'S

MY E-MAIL IF YOU WANT TO LOOK AT IT, YOU WILL SEE CHANGES THROUGHOUT

THE SUMMER.

YOU KNOW, IT'S FUNNY.

WORD PROBLEMS ARE SO HARD FOR EVERYONE. IT JUST ISN'T DEAF

STUDENTS. BUT THEY BRING IN SOME UNIQUE CHARACTERISTICS AND THAT'S WHY

CONCEPTUALLY WE FEEL WE HAVE TO GIVE THEM INDEPENDENT PRACTICE.

IF YOU LOOK AT DEAF STUDENTS, PARTICULARLY HERE AT N.T.I.D. WE

HAVE A HUGE TUTORING STAFF. I MEAN WE MUST HAVE 50 OR 60 TUTORS THAT

ARE REGULARLY SCHEDULED INTO THE LEARNING CENTER AND THEY RUN FROM 9 IN

THE MORNING TO 9 AT NIGHT. MAYBE 11 DURING FINALS.

WE HAVE TUTORS IN THE CROSS REGISTERED STUDENT PROGRAM. THERE'S

ROUGH ASCII

STILL NOT ENOUGH TUTORS. IF YOU ARE STILL SEEING 50 OR 60, WE HAVE

1200 STUDENTS. SO TUTORING WILL NOT SOLVE ALL THE PROBLEMS.

BUT THIS IS 24 HOURS A DAY. ANY TIME THE STUDENT GETS ON IT.

THEY CAN GO THROUGH IT. IF IT'S TOO EASY MOVE TO A DIFFICULT STEP.

THEY CAN PRACTICE EXACTLY WHAT THEY NEED. IT GIVES THEM ENOUGH.

WE HAVE A TEAM OF PEOPLE SELECTING THE PROBLEMS, WORKING ON IT.

WE THEN ARE GOING TO SHOOT THEM OUT TO TEACHERS OF THE DEAF TO LOOK AT

THE WORDING AND MAYBE ADDITIONAL HINTS. TEACHERS OF THE DEAF TWO TEACH

MATH. AND THEN EVENTUALLY WE WILL DO THAT WITH TEACHERS OF LEARNING

DISABLED SO THAT WE WILL FINE TUNE THIS SO THAT WE HOPE, THE LANGUAGE

ISN'T SO SOPHISTICATED THAT THEY WON'T DO IT. BUT EVERYTHING WILL BE

WITHIN THE READABILITY LEVEL OF THE STUDENTS.

NOW WHAT WE HAVE DECIDED NOT TO DO, AND IF YOU HAVE THAT QUESTION,

WE GET IT ALL THE TIME.

WE ARE DOING NO SIGN LANGUAGE. EVERY WHERE I GO PEOPLE SAY WHY

DON'T YOU HAVE SOMEONE SIGNING THE PROBLEMS?

WELL THERE'S PROBLEMS WITH THAT. IN THE REAL WORLD THERE'S NO ONE

THERE TO SIGN THE PROBLEM. SECOND OF ALL WE ARE TRYING TO GET THEM

OVER THE ANXIETY OF DEALING WITH THE WRITTEN LANGUAGE. AND THIRD, IF

YOU DO SIGN LANGUAGE, OFTEN YOU GIVE THE ANSWER AWAY BECAUSE

CONCEPTUALLY AND SPACE, YOU HAVE SEPARATED AND ORGANIZED THE FORM.

SO WE ARE TRYING TO GET THEM TO STRUGGLE WITH THIS.

QUESTIONS?

>>AUDIENCE MEMBER: I HAVE A QUESTION ABOUT IMPLICATIONS FOR TEACH.

ROUGH ASCII

LET'S SAY MIDDLE SCHOOL OR HIGH SCHOOL. THAT WILL COME TO N.T.I.D.

LATER, WOULD YOU SUGGEST YOU -- THEY SHOULD HAVE CONFIDENCE IN DEALING

WITH THE GRAPHIC PROBLEMS BEFORE WORD? THE WORD PROBLEMS?

>>RONALD KELLY: I DON'T KNOW. WE HAVEN'T THOUGHT OF SEQUENCE YET.

WE ARE GOING TO MAKE THIS AVAILABLE TO HIGH SCHOOL TEACHERS, 9TH

THROUGH 12.

SO OUR HOPE IS THAT WE CAN GET STUDENTS PRACTICING WITH THESE

THINGS AS LOW AS 9TH GRADE.

THESE ARE ALL WORD PROBLEMS. WE HAVE NO REALLY GRAPHIC PROBLEMS

IN HERE. BECAUSE STUDENTS COME AND THEY DO PRETTY WELL WITH -- THEY

SEE THE NUMBER. THEY SEE THE FIGURE, THE GRAPH.

THEY CAN CALCULATE IT. THEY DON'T HAVE ANY FEAR. SHOW THEM A

WORD PROBLEM EVEN THOUGH IT'S THE SAME PROBLEM, AND IT'S LIKE THAT.

SO, I WOULD SAY AS WITH EVERYTHING, THIS IS A NO BRAINER BY THE

WAY. IN PSYCHOLOGY WE CALL IT TIME ON TASK.

YOU GET BETTER, THE MORE YOU DO SOMETHING.

AND IF I HAVE ANY COMPLAINT, IS STUDENTS DON'T GET ENOUGH

INTENSITY FOR PRACTICE. WE ARE TRYING TO PROVIDE THAT.

BUT NO ONE COMES EXPERT OR SKILLED UNLESS THEY DO IT OVER AND OVER

AND OVER AGAIN AND BECOME SO FAZZLED WITH THAT SKILL, THAT IT BECOMES

AUTOMATIC.

I MEAN WE DON'T SEND PILOTS TO THE MOON. WE DON'T SEND ASTRONAUTS

WITHOUT THOUSANDS OF HOURS ON SIMULATORS. YET SOME OF OUR STUDENTS

COME THEY WANT TO SEE IT ONCE AND THEY ARE FINISHED. THEY LEARNED IT.

WELL I TEACH STATISTICS. BEFORE EVERY TIME I TEACH STATISTICS I

ROUGH ASCII

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START READING MY BOOKS ABOUT A MONTH BEFORE CLASS BECAUSE UNLESS YOU DO

IT EVERY DAY, YOU KIND OF FUZZY ON THE CONCEPTS. SO YOU WANT TO MAKE

SURE YOU INCLUDE EVERYTHING.

REFRESHER, PRACTICE. GO BACK. AND TIME ON TASK.

I AM THE OLD SCHOOL. I WOULD LIKE TO SEE THEM GO BACK AND HAVE

LOTS OF HOMEWORK AND LOTS OF PRACTICE.

>>AUDIENCE MEMBER: I HAVE A QUESTION ABOUT HOW YOU HAVE THE LITTLE

SQUARES THAT POP UP WHERE THEY HAVE TO DECIDE WHAT'S THE GOAL, THINGS

LIKE THAT. THIS IS JUST MY OWN OBSERVATION. IT SEEMS AS IF EACH ONE

YOU WENT TO IT WAS ALWAYS THE BOTTOM ONE THAT WAS THE CORRECT ANSWER.

>>RONALD KELLY: YOU ARE THE SECOND PERSON WHO RAISED THAT.

NO. TWO OF THEM HAVE THE BOTTOM ONE BUT THE OTHERS ARE RANDOM.

WE ARE RANDOMLY SCATTERING THAT.

>>AUDIENCE MEMBER: I WONDERED THAT.

>>RONALD KELLY: BUT I ADMIT WE ALREADY HAD THAT QUESTION. YES?

>>AUDIENCE MEMBER: YOU SAID YOU ARE KEEPING A RELATED DATA BASE OF

STUDENT WORK

>>RONALD KELLY: PERFORMANCE.

>>AUDIENCE MEMBER: IS THAT SOMETHING THAT THE CLASSROOM TEACHER WILL

ROUGH ASCII

BE ABLE TO ACCESS SO THEY CAN SEE WHERE THEIR STUDENTS ARE HAVING THE

MOST DIFFICULTY.

>>RONALD KELLY: WE ARE STRUGGLING WITH THAT. WHAT WE ARE REALLY

GOING TO DO IS TAKE THEIR ANSWERS AND SAVE THEM TO A SPREAD SHEET LIKE

EXCEL OR SOMETHING. WHEN YOU HAVE A FEDERAL GRANT YOU HAVE

CONFIDENTIALITY ISSUES. THE INSTITUTE HAS CONFIDENTIALITY ISSUES. I

AM A RESEARCHER.

ANY DATA WE COLLECT, WE THEORETICALLY ARE NOT TO SHARE THAT

INFORMATION WITH PEOPLE. WE CAN SHARE AGGREGATE DATA. WE ARE NOT

SUPPOSED TO GIVE NAMES AND EVERYTHING.

SO WE HAVEN'T RESOLVED THAT YET. WE THOUGHT ABOUT IT. WE

STRUGGLED WITH IT. WE DON'T KNOW YET WHAT WE ARE GOING TO DO.

ALTHOUGH THERE IS A WEBSITE IN NORTH CAROLINA. AND THEY DO TESTS

ON-LINE. AND ALL THAT DATA IS AVAILABLE TO THE TEACHERS.

SO I GUESS THERE ARE WAYS TO DO THIS. AND WE ARE LOOKING AT DOING

SOMETHING LIKE THAT. THAT'S ALSO A FIPSE GRANT. YOU CAN ACTUALLY GO

IN AND BUILD YOUR TEST AND THEN IT'S COLLECTED ON-LINE AND THEY GIVE

YOU THE RESULTS.

THAT'S AVAILABLE TO TEACHERS. SO WE ARE PROBABLY GOING TO LOOK AT

A MODEL LIKE THAT AND TALK TO THEM TO SEE IF WE CAN DO SOMETHING LIKE

THAT.

BUT WE HAVE TO BE SURE THAT IF A TEACHER GETS THIS, THEY ONLY HAVE

ACCESS TO THEIR STUDENTS, NOT ANYBODY ELSE.

SO WE JUST HAVEN'T GONE THAT FAR. WE TALKED ABOUT IT. WE DON'T

KNOW QUITE WHAT TO DO ABOUT IT.

OTHER QUESTIONS?

>>AUDIENCE MEMBER: IN YOUR ORIGINAL SLIDE YOU SAID GRADE 6 TO 12. IS

YOUR INTENT TO MOVE IT DOWN?

>>RONALD KELLY: WELL THIS COULD BE MOVED DOWN, WAY DOWN, I MEAN YOU

CAN DO THIRD GRADE, SECOND GRADE. IF YOU PICK THE RIGHT PROBLEMS AND

THE CONTENT.

WHEN WE ORIGINALLY STARTED THIS I GUESS I DIDN'T NOTICE, THIS IS A

PRESENTATION IN FEBRUARY.

KICK HER OUT.

THE ORIGINAL CONCEPT WHEN WE PUT THE GRANT IN IS 6 TO 12. WE

THINK IT'S TOO BIG A RANGE SO NOW WE ARE NARROWING IT TO THE HIGH

SCHOOL STUDENTS WHO ARE READY TO COME.

BUT CONCEPTUALLY THIS COULD BE THIRD, FOURTH, WORD PROBLEMS,

COMPARE, CONTRAST. HOW MANY. I MEAN (CONTRAST) JUST THE CONTENT WOULD

HAVE TO COME DOWN.

>>AUDIENCE MEMBER: IT'S YOUR WHOLE PREMISE TO ANALYZE THE DATA. IF

WE COULD START WITH YOUNGER STUDENTS, THE EXAM IS WORD PROBLEMS, WE ARE

TRYING TO PREPARE OUR STUDENTS FOR IT TO ADD TO IT.

>>RONALD KELLY: LET ME TELL YOU WHERE WE ARE. FIPSE IS

POSTSECONDARY. THOUGH FUND INNOVATION AND COLLEGES. BUT AFTER WE GOT

THE GRANT THEY SAID OKAY, WHERE DOES THIS APPLY? AND THEY WANT -- THEY

ARE PUSHING US TO PUSH IT FURTHER AND FURTHER DOWN.

WELL, SO WE KNOW IN THE LONG HAUL OVER TEN YEARS WE WILL HAVE A

FULL RANGE OF STUDENTS. THAT'S OUR GOAL.

BUT RIGHT NOW, IT STARTS OUT WITH COLLEGE. WE ARE PUSHING IT DOWN

9 TO 12. THEN WE WILL PROBABLY GO DOWN UPPER ELEMENTARY TO NINE. AND

THEN LOWER.

BUT WE WILL NEED A BIGGER STAFF. EVERY PROBLEM HAS TO BE SET DOWN

AND GO THROUGH AND TESTED AND GET BACK. WE ARE LITERALLY WRITING HELP

INDIVIDUAL FOR EACH PROBLEM.

ON A TEMPLATE OF COURSE.

ANY OTHER QUESTIONS?

>>AUDIENCE MEMBER: IN THE -- YOU ARE SHOWING US -- FOR EXAMPLE HOW

MANY STUDENTS -- HOW MANY STUDENTS -- DEAF STUDENTS, HOW MANY HEARING

STUDENTS? YOU ARE PRESENTING?

>>RONALD KELLY: WE DON'T KNOW. BUT WE ON THE COUPLE OF STUDIES WE

HAVE DONE HERE LIKE WE HAVE 100 DEAF STUDENTS IN ONE OF OUR WORD

PROBLEM STUDIES. ON THIS, ON THIS, WE ARE GOING TO DO SOME CONTROLLED

TESTING WITH N.T.I.D. STUDENTS AND WITH HIGH SCHOOL STUDENTS. AND WE

ARE HOPING FOR 50 TO 60 STUDENTS IN EACH GROUP.

50 TO 60 SHOULD GIVE US SUFFICIENT STUDENT NUMBERS FOR POWER OF

ANY CHANGES.

BUT IN TERMS OF THE ACTUAL FIELD TEST, IT'S -- IF I UNDERSTOOD

YOUR QUESTION, ANYONE COULD USE IT. ANYWHERE IN THE COUNTRY OR THE

WORLD EVEN.

BUT RIGHT NOW WE ARE TARGETING AROUND 50 STUDENTS PER STUDY AS WE

FIELD TEST THIS AND AS WE DO THE CONTROLLED STUDIES HERE IN THIS

ENVIRONMENT AND IN THE HIGH SCHOOLS HERE.

DID THAT ANSWER IT OR WAS I CONFUSING? OKAY.

I THINK WE HAVE TIME FOR A FEW MORE QUESTIONS.

>>AUDIENCE MEMBER: ONE OR TWO QUESTIONS.

>>RONALD KELLY: ONE OR TWO.

WELL, NO QUESTIONS? I HOPE IT WAS CLEAR.

>>AUDIENCE MEMBER: WE DO HAVE HANDOUTS

>>RONALD KELLY: OH, I DO HAVE HANDOUTS BUT AGAIN ALL OF THESE WILL BE

POSTED ON THE WEB.

SO IF YOU DON'T -- IF THEY RUN OUT, IT WILL STILL BE AVAILABLE TO

YOU OKAY?

CARLA WHY DON'T YOU PUT THESE.

>>SPEAKER: I REMIND YOU TO EVALUATE THE SESSION YOU CAN DO THAT ON THE

WEB OR ON THE GREEN EVALUATION SHEETS.

AND YOU CAN PICK THOSE OUT ON YOUR WAY OUT ALSO. (APPLAUSE).

ROUGH ASCII

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THANK YOU VERY MUCH.

>>RONALD KELLY: THANK YOU.