

Dobar den and **miredita** to my Macedonian & Albanian Colleagues @ SEEU
from drBOB Appelman, PhD
& Indiana University – Bloomington

- My PhD Degree in 1993 – **Instructional Systems Technology (IST)**

- THE EMPHASIS IS NOT ON TECHNOLOGY BUT
INSTEAD ON THE WORD SYSTEM

- **Dobar den** and **Miirdita** to my **Macedonian & Albanian Colleagues** here at **SEEU** today
- My NAME IS **DRBOB** APPELMAN
 - THEY CALL ME DR BOB BECAUSE MY FATHER WAS A PROFESSOR OF MUSIC AT IU... AND ONE DR APPELMAN WAS ENOUGH, SO I USED THE MORE INFORMAL MONIKER OF DR BOB.
THAT HAS STUCK FOR MY WHOLE CAREER.
- **CLICK**
- I EARNED 3 DEGREES AT IU, AND IN 1969 I LEFT THE UNIVERSITY TO BECOME A FILM DIRECTOR MAKING PR FILMS & TV COMMERCIALS. BUT BY 1981 I GOT TIRED OF THAT 24-7 DAILY GRIND AND RETURNED TO IU TO GET MY PHD IN **INSTRUCTIONAL SYSTEMS TECHNOLOGY**.
- **CLICK**
- A POINT OF CLARIFICATION ABOUT THE IST DISCIPLINE:
 - THE FOCUS IS **NOT ON TECHNOLOGY** BUT INSTEAD ON THE WORD **SYSTEM**

- IN **2007** I HAD THE FORTUNE TO BE INVITED TO **SEEU** TO DO A WORKSHOP ON VIRTUAL LEARNING USING ANGEL.
 - I TRULY ENJOYED WORKING WITH MANY OF YOU WHO ARE PROBABLY HERE WITH US TODAY, BUT WITHOUT THAT EXPERIENCE I WOULD NOT HAVE BEEN ABLE TO PUT THE INSTRUCTIONAL SYSTEM TOGETHER FOR THIS PRESENTATION.

INCREASING ENGAGEMENT
BY INTEGRATING GAME MECHANICS
INTO YOUR TEACHING METHODOLOGY

Presented by
drBOB Appelman
Instructional Systems Technology
At Indiana University - Bloomington

- SO LET'S BEGING WITH THE PRESENTATION
- **INCREASING ENGAGEMENT BY INTEGRATION GAME MECHANICS INTO YOUR TEACHING METHODOLOGY**

Methodology

- A list of EVENTS that you plan for YOU & YOUR STUDENTS to do during your instruction.
 - Presentation of FACTS or PRINCIPLES VERBALLY by the Instructor, with STUDENTS listening and then TESTED on memorization of FACTS = **DIDACTIC**
 - Presentation of FACTS & PRINCIPLES EMBEDDED in a CASE STUDY by the Instructor, with STUDENTS listening, then MEETING IN SMALL GROUPS to discuss the CASE STUDY, and then TESTED on how well they processed the INFORMATION they received, and then GRADED by using a RUBRIC = **COLLABORATIVE LEARNING**
 - SHORTER presentation of a REAL-WORLD PROBLEM with COMMON SOLUTIONS OUTLINED, with STUDENTS WORKING IN SMALL GROUPS TO SOLVE THIS PROBLEM IN A DIFFERENT CONTEXT, and then TESTED on HOW THEIR SOLUTIONS FOLLOW A PRE-DEFINED RUBRIC = **COLLABORATIVE PROBLEM-BASED LEARNING**

- WHY AM I USING THE WORD METHODOLOGY?
 - BECAUSE **WHATEVER YOU LIST** IN THE SEQUENCE OF EVENTS YOU PLAN FOR YOUR TEACHING ... **DESCRIBES YOUR METHODOLOGY**
 - **CLICK**
 - FOR INSTANCE:
 - The PRESENTATION OF **FACTS VERBALLY**, with **STUDENTS LISTENING AND TAKING NOTES**, **THEN TESTED** is a **DIDACTIC METHODOLOGY**
 - **CLICK**
 - THE EVENTS HIGHLIGHTED HERE ARE CALLED **TEACHING STRATEGIES** BUT I AM GOING TO CALL THEM **TEACHING MECHANICS** IN THIS PRESENTATION
 - **CLICK**
 - The PRESENTATION OF **FACTS ALONG WITH A CASE STUDY**, with **STUDENTS LISTENING AND DISCUSSING** THE CASE STUDY IN SMALL GROUPS AFTER THE LECTURE, **THEN TESTED ON THEIR COMMENTS ABOUT THE CASE STUDY** USING THE FACTS HEARD IN THE LECTURE, is a

COLLABORATIVE LEARNING METHODOLOGY,

- (usually graded using a PRE-DEFINED RUBRIC)
- **CLICK**
 - The RELATIVELY **SHORTER PRESENTATION** OF A **REAL-WORLD PROBLEM** WITH COMMON SOLUTIONS AND RESULTS OUTLINED, with **STUDENTS LISTENING & THEN WORKING IN SMALL GROUPS** TO ARRIVE AT A SOLUTION THAT MAY BE IN A **CONTEXT DIFFERENT FROM WHAT THE INSTRUCTOR PRESENTED** and **TESTED ON HOW THEIR SOLUTIONS FOLLOW A PRE-DEFINED RUBRIC**, IS A **COLLABORATIVE PROBLEM-BASED LEARNING METHODOLOGY.**
- **CLICK**
- [IF DEEMED APPROPRIATE]
- I MENTORED UNDER A PROFESSOR AT IU WHO RECEIVED THE HIGHEST TEACHING AWARD
 - HE MADE ME DO WHAT HE DID FOR EVERY CLASS, AND THAT WAS TO WRITE OUT A LIST OF EVERY ACTION THE HE, OR HIS STUDENTS, WERE PLANNING TO DO ...
 - IT WAS BASICALLY A SCRIPT FOR EVERY 10 MINUTES OF CLASS (USUALLY ABOUT 3 PAGES WORTH),
 - WHENEVER I DID THAT, THE CLASS WENT SMOOTHER, THE STUDENTS LEARNED MORE, AND I GOT BETTER CLASS EVALUATIONS (Quality Assurance)
- A list of **EVENTS** that you plan for you & your students to do during your instruction, is a list of the **TEACHING MECHANICS** you use
- So in the first example there are **3 basic mechanics** used:
 - A VERBAL PRESENTATION
 - STUDENTS LISTEN and TAKE NOTES
 - STUDENTS ARE TESTED ON THE FACTS
- In the second example we added **3 more mechanics**:
 - A CASE STUDY
 - SMALL GROUPS
 - A RUBRIC
- In the third example we added **4 more mechanics**:
 - A REAL WORLD PROBLEM (that is often stated as a **story**)
 - COMMON SOLUTIONS TO THAT PROBLEM
 - A CHALLENGE FOR THE STUDENTS TO SOLVE THE SAME PROBLEM BUT IN A DIFFERENT CONTEXT
 - COLLABORATIVE PROBLEM SOLVING

HOW DO WE KNOW WHICH MECHANIC TO USE? AND AT WHAT TIME?

RUBRIC For PLAYING A JAZZ Instrument	CRITERIA	Poor (1 point)	Fair (2 points)	Good (3 points)	Excellent (4 points)	Totals
	Intonation/Tone:	The majority of the notes were either sharp or flat. Tone was thin, airy, and unsupported the whole time.	A significant number of the notes were either sharp or flat. Tone was thin, airy, and unsupported most of the time.	A few of the notes were either sharp or flat. Tone was full, clear and had presence most of the time.	All of the notes were played in tune. Tone was full, clear and had presence the whole time.	2
	Knowledge of Instrument:	Utilized a minimal part of the instrument's register with a lot of difficulty. Demonstrated only one articulation style.	Utilized the middle of the instrument's register mostly with ease and flexibility. Demonstrated a couple articulation styles.	Utilized most of the instrument's register with ease and flexibility. Demonstrated a few articulation styles.	Utilized the full register of the instrument with ease and flexibility. Demonstrated many articulation styles.	3
	Sense of Time:	Internalized the tempo and maintained a steady pulse with the other players very little of the time.	Internalized the tempo and maintained a steady pulse with the other players half of the time.	Internalized the tempo and maintained a steady pulse with the other players most of the time.	Internalized the tempo and maintained a steady pulse with the other players the whole time.	4
	Knowledge of Melody:	Performed the melody with accurate notes and rhythms very little of the time.	Performed the melody with accurate notes and rhythms half of the time.	Performed the melody with accurate notes and rhythms most of the time.	Performed the melody with accurate notes and rhythms the whole time.	2
	Knowledge of Chords:	Followed the chord changes by utilizing the related scales and patterns very little of the time.	Followed the chord changes by utilizing the related scales and patterns half of the time.	Followed the chord changes by utilizing the related scales and patterns most of the time.	Followed the chord changes by utilizing the related scales and patterns the whole time.	2
	Level of Creativity:	Utilized no variety of improvisational techniques such as pitch bends, dynamics, melodic phrasing, quotes, rhythmic variation, and sequencing.	Utilized a little variety of improvisational techniques such as pitch range, dynamics, melodic phrasing, quotes, rhythmic variation, and sequencing.	Utilized some variety of improvisational techniques such as pitch range, dynamics, melodic phrasing, quotes, rhythmic variation, and sequencing.	Utilized a lot of variety of improvisational techniques such as pitch range, dynamics, melodic phrasing, quotes, rhythmic variation, and sequencing.	1
Final Grade (24 points total):					14	

- BTW - A **RUBRIC** is **NOT** used to grade **DIDACTIC** methodologies because you only need to see if the student has memorized the fact, or a close proximity.
- A RUBRIC is essential to grade any of the HIGHER LEARNING METHODOLOGIES where the STUDENT has made JUDGEMENT or PERFORMANCE DECISION.
 - Such as ESSAYS, PRESENTATIONS, or GRAPHIC REPRESENTATIONS
 - It is also useful for grading DISCUSSIONS and FORUMS
- EACH ROW REFERS TO A LEARNING GOAL THAT THE INSTRUCTOR HAS DETERMINED
- (TOTALED ACROSS EACH ROW AND MARKED AT THE END OF EACH ROW ON THE RIGHT)
- EACH COLUMN REFERS TO A LEVEL OF ACHIEVEMENT (**LOW -1_ MEDIUM-2_ GOOD-3_ EXCELLENT-4**)
 - THE COMMENTS INSIDE EACH CELL ARE IDENTICAL TO THOSE FOUND WRITTEN IN THE MARGINS OF AN ASSIGNMENT BY AN INSTRUCTOR
 - COMMENT (**READ THROUGH**) THE 4TH THAT JUDGES THE STUDENT'S PERFORMANCE OR DESCRIPTION TO "**KNOWLEDGE OF MELODY**" LEARNING GOAL

- **USE LASER POINTER AS YOU TALK**

- FOR THE INSTRUCTOR THIS CAN BE A MUCH QUICKER PROCESS
- SINCE A GRADING GRID, THAT MATCHES THE RUBRIC, CAN BE CREATED THAT ALLOWS THE INSTRUCTOR TO
- PLACE A NUMBER (1-4) TO THE RIGHT OF EACH ROW AND THEN TOTAL THE RESULT

- **CLICK**

The CONTENT, & YOUR GOALS for the STUDENTS, DRIVE the MECHANICS you use

- Organize and PRIORITIZE your CONTENT
 - Based on this PRIORITIZATION ...
 - and student's PRIOR KNOWLEDGE of the content
- Set your GOALS for the LEVEL OF LEARNING for the students
- USE the BLOOM'S MASTER DESIGN CHART

- The instructor must be able to identify the IMPORTANT items from his own knowledge, a TEXT, or WEB RESOURCE that he or she wants the student to know.
 - THESE ARE OFTEN CALLED THE **"TAKE-AWAYS"**
- If this is the third class of a 5-day class, much of what you covered in the first two days should already be known, so the information covered on those two days may be considered part of the **student's prior knowledge**
- **CLICK**
- The **LEVELS OF LEARNING** relates to **BLOOMS TAXONOMY** where he defines **6 levels of ability** the student may have with the new knowledge received from a class session
- **EACH LEVEL OF LEARNING REQUIRES A DIFFERENT MECHANIC TO BE USED TO ACHIEVE THE DESIRED GOAL**
- **CLICK**
- BLOOM CREATED A **"MASTER DESIGN CHART"** FOR THIS SPECIFIC PURPOSE

- **CLICK**

BLOOM'S MASTER DESIGN CHART

1	2	DETAIL	1. RECALL			2. UNDERSTAND			3. APPLY			4. ANALYZE			5. SYNTHESIZE		6. EVALUATE		TOTALS			
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P		Q	R	S
		OVER-ARCHING CONCEPT OR PRINCIPLE	IDENTIFY	DESCRIBE	RECOGNIZE	DETERMINE BETWEEN	USE EXAMPLE	PRODUCE	DEMONSTRATE	DISCOVER	OPERATE	IMPLEMENT	COMPARE	OUTLINE	RECONSTRUCT	DISCRIMINATE	ANALYZE	DESIGN	CREATE	IMPLEMENT	EVALUATE	CONTENT TOTALS
	3																					
	4	GEOGRAPHY	EARTH'S AXIS	5	5	5		5	5	5		5										5
	5	GEOGRAPHY	AXIS TILT of 23.5°	5	5	5		5	5	5		5				5	5					5
	6	ASTRONOMY	EARTH'S AXIS is TILTED 23.5° on its ORBITAL PLANE	6	6	6		6	6	6		6										48
	7	ASTRONOMY	NP CLOSEST = S SOL	5	5	5		5	5	5		5										30
	8	ASTRONOMY	NP FARTHEST = W SOL	5	5	5		5	5	5		5										30
	9	ASTRONOMY	NP MIDWAY = V & A EQ	5	5	5		5	5	5		5										30
	10	ASTRONOMY	apparent REVOLUTION of the SUN versus the actual ROTATION of the SUN	5	5	5	5	5	5													30
	11	GEOGRAPHY	LATITUDE (determined by the degree from horizontal of a line drawn from the center and intersecting the EARTH)	5	5	5		5		5			5									30
	12	GEOGRAPHY	LONGITUDE (a series of lines drawn from the N to S Pole every 15°)	5	5	5		5		5			5									30
	13	GEOGRAPHY	TROPIC OF CAPRICORN	4	4	4		4	4	4		4										28
	14	GEOGRAPHY	SOLSTICE LINES	4	4	4		4	4	4		4										28
	15	GEOGRAPHY	TROPIC OF CANCER	4	4	4		4	4	4		4										28
	16	OBJECT	SPHERE					4		5		5			4	4					4	28
	17	OBJECT	EARTH					5		5		5		5	5						5	28
			at NOON (ST) the SUN is																			

- NOW TAKE A DEEP BREATH, BECAUSE IT'S NOT AS COMPLICATED AS IT FIRST APPEARS
- THIS IS JUST A COMPLETED XCEL SPREADSHEET,
 - This is one that I completed for a lesson I will showing you later on building a SUNDIAL
- THERE ARE ONLY 3 BASIC SECTIONS THAT YOU NEED TO ATTEND TO
 - THE **DETAIL COLUMN**
 - THE **TEACHING METHODOLOGY GOAL**
 - THE **DATA FIELD** where each cell under a specific LEARNING LEVEL receives a number **between 1 & 9**
- LET'S LOOK AT EACH OF THESE IN MORE DETAIL
- CLICK

BLOOM'S MASTER DESIGN CHART

1	2	DETAIL	1. RECALL			2. UNDERSTAND			3. APPLY			4. ANALYZE			5. SYNTHESIZE			6. EVALUATE			TOTALS	
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R		S
3		OVER-ARCHING CONCEPT OR PRINCIPLE	IDENTIFY	DESCRIBE								OUTLINE	RECONSTRUCT	DISCRIMINATE	ANALYZE	DESIGN	CREATE	IMPLEMENT	EVALUATE	CONTENT TOTALS		
4	GEOGRAPHY	EARTH'S AXIS	5	5																5	5	10
5	GEOGRAPHY	AXIS TILT of 23.5°	5	5																5	5	10
6	ASTRONOMY	EARTH'S AXIS is TILTED 23.5° on its ORBITAL PLANE	6	6																		12
7	ASTRONOMY	NP CLOSEST = S SOL	5	5																		10
8	ASTRONOMY	NP FARTHEST = W SOL	5	5																		10
9	ASTRONOMY	NP MIDWAY = V & A EQ	5	5																		10
10	ASTRONOMY	apparent REVOLUTION of the SUN versus the actual ROTATION of the SUN	5	5																		10
11	GEOGRAPHY	LATITUDE (determined by the degree from horizontal of a line drawn from the center and intersecting the EARTH	5	5																		10
12	GEOGRAPHY	LONGITUDE (a series of lines drawn from the N to S Pole every 15°)	5	5																		10
13	GEOGRAPHY	TROPIC OF CAPRICORN	4	4																		8
14	GEOGRAPHY	SOLSTICE LINES	4	4																		8
15	GEOGRAPHY	TROPIC OF CANCER	4	4																		8
16	OBJECT	SPHERE												4	4					4	4	8
17	OBJECT	EARTH												5	5					5	5	10
		at NOON (ST) the SUN is																				

- THE DETAIL COLUMN IS SIMPLY A STRING OF CONTENT YOU WISH TO TEACH
 - This was taken from a **Lesson Plan** I pulled off the WEB about building a SUNDIAL
 - TALK THROUGH THE **CONTENT CHUNKS**
 - TALK THROUGH THE **LEFT COLUMN - CATEGORIES (Axis tilt – Geography and Orbital Plane – Astronomy)**

BLOOM'S MASTER DESIGN CHART

1	2	DETAIL	1. RECALL			2. UNDERSTAND			3. APPLY			4. ANALYZE			5. SYNTHESIZE		6. EVALUATE		TOTALS			
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P		Q	R	S
OVER-ARCHING CONCEPT OR PRINCIPLE			IDENTIFY	DESCRIBE	RECOGNIZE	DISTINGUISH BETWEEN	GIVE EXAMPLE	PREDICT	DEMONSTRATE	DISCOVER	OPERATE	IMPLEMENT	COMPUTE	OUTLINE	RECONSTRUCT	DISCRIMINATE	ANALYZE	DIVISION	CREATE	IMPLEMENT	EVALUATE	CONTENT TOTALS
4	GEOGRAPHY	EARTH'S AXIS	5	5	5		5	5	5	5												36
5	GEOGRAPHY	AXIS TILT OF 23.5°	5	5	5		5	5	5	5						5	5					5
6	ASTRONOMY	EARTH'S AXIS IS TILTED 23.5° TO ITS ORBITAL PLANE	6	6	6		6	6	6	6			6									36
7	ASTRONOMY																					36
8	ASTRONOMY																					36
9	ASTRONOMY																					36
10	ASTRONOMY																					36
11	GEOGRAPHY																					36
12	GEOGRAPHY																					36
13	GEOGRAPHY		5	5	5		5	5	5							5						36
14	GEOGRAPHY																					36
15	GEOGRAPHY																					36
16	OBJECT	SPHERE						4	5	5				4	4							4
17	OBJECT	EARTH						5	5					5	5							5
		at NOON (ST) the SUN is																				

- The LEVELS OF LEARNING row that comes directly from BLOOM and is always the same
 - It lists the LEVELS (RECALL – UNDERSTAND – APPLY – ANALYZE – SYNTHESIZE – & EVALUATE)
 - Under these are the ACTION VERBS that describe what the Instructor wants to **OBSERVE** the student **DOING** to know they have reached that LEVEL OF COGNITION
- TALK THROUGH #1 RECALL
 - This level, and sometimes level 2, can be used with DIDACTIC METHODOLOGY
- GENERALIZE
 - Higher Level Thinking Skills require that the student demonstrate actions from levels 2 through 6
 - E.g. AXIS
- CLICK

BLOOM'S MASTER DESIGN CHART

1		DETAIL		1. RECALL			2. UNDERSTAND			3. APPLY			4. ANALYZE			5. SYNTHESIZE			6. EVALUATE			TOTALS		
2		OVER-ARCHING CONCEPT OR		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	TOTALS	
				IDENTIFY	DEFINE	COMPARE	EXPLAIN	CLASSIFY	RELATE	APPLY	ANALYZE	ANALYZE	ANALYZE	ANALYZE	ANALYZE	ANALYZE	ANALYZE	ANALYZE	ANALYZE	ANALYZE	ANALYZE	ANALYZE	ANALYZE	
				4. ANALYZE			5. SYNTHESIZE			6. EVALUATE			TOTALS											
				L	M	N	O	P	Q	R	S	TOTALS												
				OUTLINE	DECONSTRUCT	DISCRIMINATE	ANALYZE	DESIGN	CREATE	IMPLEMENT	EVALUATE	CONTENT TOTALS												
						5	5				5	50												
						5	5				5	50												
												48												
												35												
												35												

- THE **TOTALS COLUMN** SHOWS THE PRIORITY OF THE CONTENT TO BE TAUGHT (once that it has been sorted on that column)
 - THE **NUMBERS** IN THE **“TOTAL” COLUMN** ARE THE SUM OF THE NUMBERS IN EACH ROW, LEAVING THE **MOST IMPORTANT CONTENT** ITEMS ON TOP
 - In this case these top two items are the **Earth’s Axis** and the **23.5 Degree tilt**
- **CLICK**

BLOOM'S TAXONOMY are also MECHANICS

		DETAIL		1. RECALL			2. UNDERSTAND			3. APPLY			4. ANALYZE			5. SYNTHESIZE		6. EVALUATE		TOTALS	
1		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	
2	OVER-ARCHING CONCEPT OR PRINCIPLE	IDENTIFY	DESCRIBE	RECOGNIZE	DIFFERENTIATE BETWEEN	GIVE EXAMPLE	PREDICT	DEMONSTRATE	DISCOVER	OPERATE	IMPLEMENT	COMPUTE	OUTLINE	DECONSTRUCT	DISCRIMINATE	ANALYZE	DESIGN	CREATE	IMPLEMENT	EVALUATE	CONTENT TOTALS
3																					
		1. RECALL			2. UNDERSTAND			3. APPLY					4. ANALYZE			5. SYNTHESIZE		6. EVALUATE			
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	
		IDENTIFY	DESCRIBE	RECOGNIZE	DISTINGUISH BETWEEN	GIVE EXAMPLE	PREDICT	DEMONSTRATE	DISCOVER	OPERATE	IMPLEMENT	COMPUTE	OUTLINE	DECONSTRUCT	DISCRIMINATE	ANALYZE	DESIGN	CREATE	IMPLEMENT	EVALUATE	
		5	5	5		5	5	5		5					5	5					5

11		and intersecting the EARTH																			10
12	GEOGRAPHY	LONGITUDE (a series of lines drawn from the N to S Pole every 15°)	5	5	5		5		5				5								30
13	GEOGRAPHY	TROPIC OF CAPRICORN	4	4	4		4	4	4		4										28
14	GEOGRAPHY	SOLSTICE LINES	4	4	4		4	4	4		4										28
15	GEOGRAPHY	TROPIC OF CANCER	4	4	4		4	4	4		4										28
16	OBJECT	SPHERE					4			5		5				4	4				18
17	OBJECT	EARTH					5			5					5	5					25
		at NOON (ST) the SUN is																			10

- THE SUB-DIVISION OF THE LEVELS OF LEARNING INTO SPECIFIC ACTIONS CAN BE CONSIDERED TEACHING MECHANICS
- **USE LASER POINTER TO HIGHLIGHT EACH VERB**
- NOW LET'S JUMP TO GAME MECHANICS

COMPARISON OF 2 GAME MECHANICS

INTERNATIONAL FOOTBALL

11 PLAYERS ON THE FIELD

PITCH: (c) 120 yards x 75 yards

THE BALL PRIMARILY STAYS ON THE GROUND

SAME

SAME

DIFFERENT

AMERICAN FOOTBALL

11 PLAYERS ON THE FIELD

FIELD: 100 YARDS X 60 YARDS

THE BALL PRIMARILY STAYS OFF THE GROUND

- NOW LET'S COMPARE THE MECHANICS OF TWO GAMES WITH THE SAME NAME BUT WITH VERY DIFFERENT MECHANICS
 - FOOTBALL
- READ THE SCREEN
- THE "RULES" OF THE GAME SPECIFY EXACTLY WHAT EACH MECHANIC DOES.
 - WHEN I WAS PUTTING THIS PRESENTATION TOGETHER, THE THOUGHT OCCURRED TO ME THAT IT WOULD BE POSSIBLE FOR AN AMERICAN FOOTBALL PLAYER TO DO A "HEADER" OFF THEIR HELMET TO ANOTHER PLAYER WHO COULD CATCH IT, BUT I HAVE NO IDEA HOW THE RULES WOULD TREAT SUCH A MECHANIC

COMPARISON BETWEEN GAME AND TEACHING MECHANICS

- MECHANICS IN A GAME ARE MOSTLY PROCEDURAL & EXPERIENTIAL
- MECHANICS IN TEACHING ARE MOSTLY COGNITIVE
 - *This is something you can't OBSERVE*
 - *So, one goal of integrating game mechanics into you teaching methodology is to make the student DO something that gives the LECTURER some EVIDENCE of how the audience is following the content flow.*
- *Generally, anything one DOES inside either a CLASSROOM CONTEXT or a GAME is called a MECHANIC*

- **CLICK**
- IF I WERE TEACHING FOOTBALL (EITHER ONE) I WOULD BE SPECIFYING THINGS THAT ARE PROCEDURAL
 - DO THIS, THEN DO THIS, ETC
- OR EXPERIENTIAL
 - PRACTICE THIS, THEN THIS, ETC
- **CLICK**
- I CAN TEACH COGNITIVE CONCEPTS AND PRINCIPLES, AND EVEN DESCRIBE PROCEDURES AND PROCESSES, BUT I HAVE NO IDEA WHAT THE STUDENT IS PROCESSING IN THEIR BRAIN
 - SO OTHER THAN A GLASSY EYED STARE, THEIR HEAD NODDING, OR THEY ARE LOOKING AT THEIR PHONES, I DON'T KNOW IF THEY'RE WITH ME.
- IN MY EXAMPLE OF BREAKING THE CLASS INTO GROUPS AND/OR HAVING A DIALOG WITH THEM, IS THE ONLY WAY TO HAVE THEM EXPRESS WHAT THEY UNDERSTAND.

- **CLICK**
- USING GAME MECHANICS CAN OFTEN FLUSH OUT AND MAKE VISIBLE WHAT NORMALLY IS ONLY COGNITIVE
- **CLICK**

TYPES OF GAMES

- THERE ARE BASICALLY 4 TYPES OF GAMES

1. 1ST PERSON SHOOTER

2. SIMULATION

3. ROLE-PLAYING GAMES (RPG)

4. PERVASIVE

(ANY OF THE ABOVE DONE OUTSIDE IN THE "REAL" WORLD)

- THERE ARE 4 TYPES OF GAMES
 - A **FIRST PERSON SHOOTER GAME**
 - WHERE THE PLAYER IS IN COMBAT WITH SOME ADVISARY (this is by far the most prolific VIDEO GAME STYLE)
 - A **SIMULATION**
 - WHERE THE PLAYER ACTIVATES, BUILDS, OR INTERACTS WITH "REAL-LIKE" OBJECTS IN THE WORLD (most prolific in the science fields)
 - A **ROLE-PLAYING GAME (OR RPG)** (where the player takes on a SPECIFIC CHARACTER that interacts with other players according to how their character would interact)
 - E.g. WORLD OF WARCRAFT that is played on-line
 - A **PERVASIVE GAME** (where any game style is played, but IN THE REAL WORLD)
 - E.G.:

- 1ST PERSON SHOOTER -- LASER TAG
- SIMULATION -- CHEMISTRY DEMONSTRATION
- RPG -- A PLAY OR REENACTMENT (like a MOCK TRIAL)

- **CLICK ON EACH LINK AND CONTINUE BY CLICKING ON PERVASIVE**

1ST PERSON SHOOTER GAMES

- Medal of Honor

ORIENTATION USING A KEYBOARD

- Halo

IN GAME-PLAY USING A CONTROLLER

- [BACK to LIST](#)



Strategy AND SIMULATIONS

- ZOO TYCOON

X-Box controller

- TENNIS

Wii CONTROLLER

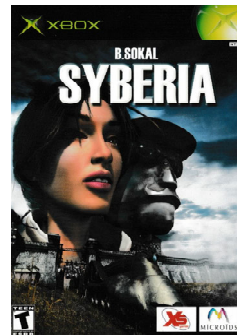
- [BACK to LIST](#)



ROLE-PLAY ADVENTURE GAME (RPG)

- **SYBERIA**
X-Box controller

- CONTENT
- MAPS & LEVELS
- STORY LINE
- ORIENTATION
- BEGIN GAME-PLAY



- [BACK to LIST](#)

LIVE-ACTION ROLE PLAY (LARP) (PERVASIVE GAMES)

- EXAMPLE OF GAME MECHANICS INTEGRATION INTO TEACHING

- Harmony High School : (Trial Run)



- CONTENT & RESOURCES
- MAPS & LEVELS
- STORY LINE
- ORIENTATION
- BEGIN GAME-PLAY

LEARNING GOALS

- A LIVE-ACTION ROLE PLAY GAME (LARP) is PERVASIVE because it is not played **VIRTUALLY**, but instead played among a group where all players are participating
- THIS MAKES IT PERFECT FOR **INTEGRATING GAME MECHANICS INTO A TEACHING METHODOLOGY**
- I DID THAT AT **HARMONY HIGH SCHOOL** IN BLOOMINGTON,
- THE CONTENT I WANTED TO TEACH WAS BASED ON A LESSON PLAN DONE BY ANOTHER TEACHER WHO PLACED THEIR PLAN ON THE WEB. IT WAS CALLED "HOW TO BUILD A SUNDIAL".
- I FIRST JUST COPIED HER CONTENT INTO **CONTENT COLUMN** OF THE **BLOOMS MASTER DESIGN CHART**
- AS I ENTERED ALL OF THE CONTENT, I REALIZED THAT JUST STATING ALL OF THESE FACTS WOULD NOT HELP THE STUDENTS UNDERSTAND WHAT WAS REALLY GOING ON SINCE THEY COULD NOT SEE IT.
SO , I HAD TO COME UP WITH A STORY LINE THAT WOULD ALLOW ME TO **HAVE THE STUDENTS "PLAY-OUT"** WHAT WAS ACTUALLY HAPPENING ASTRONOMICALLY. SO, I

CAME UP WITH A TITLE OF

OBSERVATION – TRUE OR FALSE, WHICH WAS MORE **GAME-LIKE** AND FOCUSED ON **MISSCONCEPTIONS ABOUT HOW SCIENCE REALLY WORKS.**

- **FOR EXAMPLE** -- THINGS LIKE OUR SAYING **“OH, LOOK AT THE SUN RISING”** INSTEAD OF **“OH, LOOK AT THE SUN COMING INTO VIEW”**
- SO, **MY STRATEGY WAS TO GO THROUGH THE CONTENT FOLLOWING THE HISTORY OF ASTRONOMICAL DISCOVERY**, BEGINNING WITH THE **DRUIDS** (who built STONEHENGE), ALL THE WAY THROUGH **GALLOLEO, & DA VINCI**, UP TO PRESENT DAY.
- **CLICK**

BLOOM'S MASTER DESIGN CHART

1	2	DETAIL		1. RECALL			2. UNDERSTAND			3. APPLY			4. ANALYZE			5. SYNTHESIZE			6. EVALUATE		TOTALS	
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	TOTALS	
		OVER-ARCHING CONCEPT OR PRINCIPLE	IDENTIFY	DESCRIBE	OVER-ARCHING CONCEPT OR PRINCIPLE																	CONTENT TOTALS
4	GEOGRAPHY	EARTH'S AXIS	5	5																		5
5	GEOGRAPHY	AXIS TILT of 23.5°	5	5																		5
6	ASTRONOMY	EARTH'S AXIS is TILTED 23.5° on its ORBITAL PLANE	6	6																		6
7	ASTRONOMY	NP CLOSEST = S SOL	5	5																		5
8	ASTRONOMY	NP FARTHEST = W SOL	5	5																		5
9	ASTRONOMY	NP MIDWAY = V & A EQ	5	5																		5
10	ASTRONOMY	apparent REVOLUTION of the SUN versus the actual ROTATION of the SUN	5	5																		5
11	GEOGRAPHY	LATITUDE (determined by the degree from horizontal of a line drawn from the center and intersecting the EARTH	5	5																		5
12	GEOGRAPHY	LONGITUDE (a series of lines drawn from the N to S Pole every 15°)	5	5																		5
13	GEOGRAPHY	TROPIC OF CAPRICORN	4	4																		4
14	GEOGRAPHY	SOLSTICE LINES	4	4																		4
15	GEOGRAPHY	TROPIC OF CANCER	4	4																		4
16	OBJECT	SPHERE																				4
17	OBJECT	EARTH																				5
		at NOON (ST) the SUN is																				5

[BACK TO "LARP"](#)

- **USE LASER POINTER**
- FILLING IN THE DETAIL COLUMN WITH THE **CONTENT** LISTED ON ANOTHER TEACHER'S LESSON PLAN WAS SIMPLE!
- FILLING IN THE LEVEL OF LEARNING FOR **EACH CONTENT ITEM** WAS TIME CONSUMING, AND CHALLENGED ME AS A TEACHER TO DECIDE WHAT **I WANTED TO HAVE STUDENTS DO** TO DEMONSTRATE THEIR LEARNING!
- **NOTE THAT THE CONTENT HERE HAS BEEN "SORTED"** (which is one thing nice about this being in EXCEL), **BUT ORIGINALLY** (right after I copied it in from the teacher's Lesson Plan) it was in no particular order.
- CLICK

RESOURCE EXAMPLE

- Print out Group Player CARDS - (played at appropriate times in the “STORY”)

The image shows three overlapping cards with rounded corners, each with a different colored border and header. The top-left card is blue and titled 'SCIENCE'. The middle card is green and titled 'GEOGRAPHY'. The bottom-right card is orange and titled 'ASTRONOMY'. Each card contains text about Earth's axial tilt of 23.45 degrees and its effects on seasons and the sun's position.

SCIENCE
AXIS TILT of 23.45°
• The EARTH's AXIS tilts 23.45° from a perpendicular position to the ORBITAL PLANE

GEOGRAPHY
AXIS TILT of 23.45°
• This causes changes in SEASONS
• The SUN changes position at noon at different times of the year

ASTRONOMY
AXIS TILT of 23.45°
• The EARTH's AXIS tilts 23.45° from a perpendicular position relative to its ORBITAL PLANE

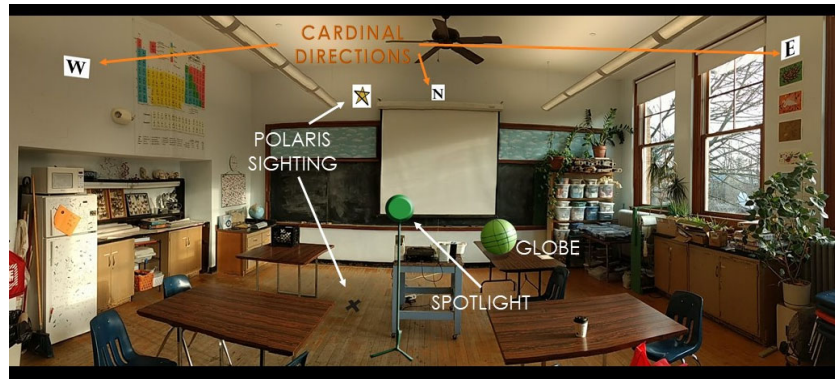
[BACK TO "LARP"](#)

- ONE OF **MY LEARNING GOALS** WAS TO HAVE THE STUDENTS BECOME FAMILIAR WITH THE DISCIPLINES OF SCIENCE, GEOGRAPHY, AND ASTRONOMY
- BUT EVEN MORE IMPORTANTLY HOW THESE DISCIPLINES DIFFERED IN THEIR VIEWS OF THE WORLD. SO I BROKE THE CLASS OF 14 INTO 3 GROUPS BASED ON THEIR OWN CHOICE OF SCIENCE, GEOGRAPHY, AND ASTRONOMY
- **CLICK**
- EACH GROUP RECEIVED A STACK OF CARDS WITH QUESTIONS RELATED TO MY LEARNING GOALS BUT ALSO PHRASED ACCORDING TO EACH DISCIPLINE
- **CLICK**
- **CLICK**
- AFTER SHARING ALL OF THE CARDS WITHIN EACH GROUP, THEY LAID THEM OUT ON THEIR TABLES AND WHENEVER THESE KEY TERMS WERE MENTIONED IN MY PRESENTATION,
- THEY WERE REQUIRED TO RAISE THEIR HAND AND THEN READ WHAT WAS ON THE

CARD

- FOR INSTANCE ON THE TOP PRIORITY QUESTION OF THE AXIS TILT **USE LASER POINTER**
 - THE **SCIENCE GROUP** GOT THIS CARD
 - THE **GEOGRAPHY GROUP** GOT THIS CARD
 - AND THE **ASTRONOMY GROUP** GOT THIS CARD
- **COMPARE AND CONTRAST THE DIFFERENCES BETWEEN THESE CARDS**

The LEARNING ENVIRONMENT



[BACK TO "LARP"](#)

- NOTE THE
 - CARDINAL DIRECTIONS
 - (I needed a LADDER to bring in)
 - POLARIS
 - STAR ON THE WALL
 - X ON THE FLOOR
 - THE SUN (SPOTLIGHT)
 - THE GLOBE (THE SPHERE)

IMPORTANT LEARNING GOALS

- WHY IS KNOWING WHAT IS DIRECTLY OVERHEAD (MY "ZENITH") SO IMPORTANT?
- COMPARE RESPONSES FROM DIFFERENT GROUPS
- CAN YOU RELATE THE "FACTS ON THE CARDS" TO THE STORY?
- HOW CAN YOU OBSERVE WHAT LATITUDE YOU ARE AT?
- HOW CAN YOU OBSERVE WHAT LONGITUDE YOU ARE AT?
- DEMONSTRATE the GLOBE/EARTH'S REVOLUTION around the SUN



ON LAST EXAMPLE

THE EARTH'S REVOLUTION AROUND THE SUN ...

NOTE THE MISTAKE

("I SAID KEEPING THE AXIS POINTING AT THE

SUN INSTEAD OF AT POLARIS")

Reflections

- The SCOPE of this content should cover 5 days
- The SEQUENCE could better be sub-divided into LEVELS for each day
- Homework would allow for elaboration by the students each day on what they researched beyond the information on the cards
- CHALLENGE QUESTIONS could be given to each group to “solve” amongst themselves before offering them to the class
- The GROUPS should be made up of students with specific skill strengths in either Science (Physics & Engineering), Geography (Life Sciences), or Astronomy
- As CARDS are “played” they should go into a box to identify points (score)

Q & A

• END

Increasing Engagement by Integrating Game Mechanics into Your Teaching Methodology

Resources Available at: <http://www.appeldesign.com/ACADEMICS/>

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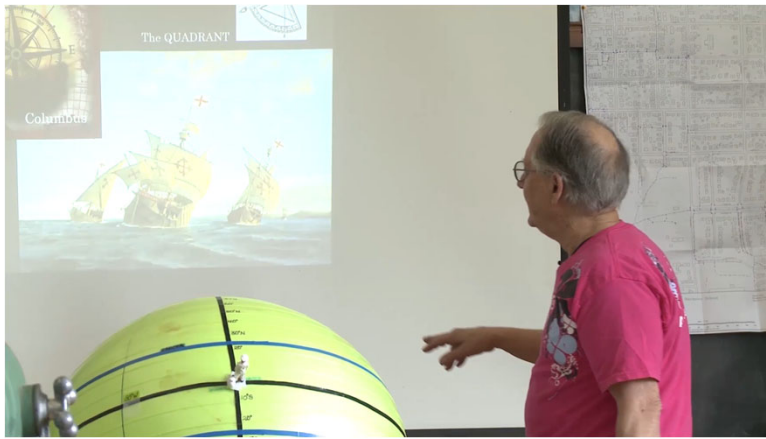
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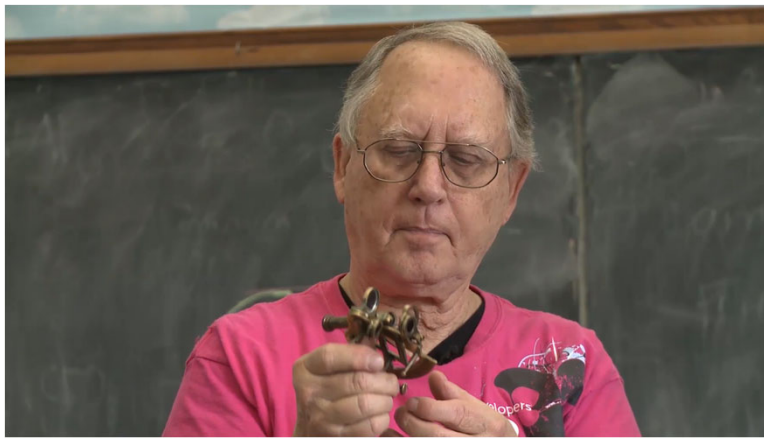
[BACK TO LEARNING GOALS](#)



BACK TO LEARNING GOALS



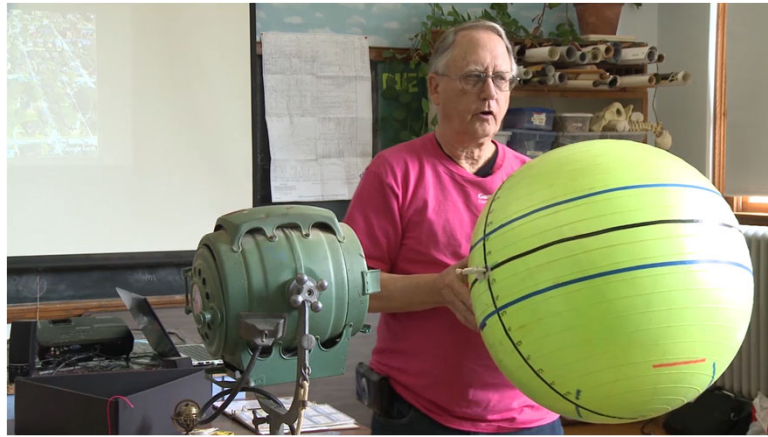
[BACK TO LEARNING GOALS](#)



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