



The Exchange

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How Does A Credit Card Work?

Dollars and Sense II: Our Interest in Interest, Managing Savings, and Debt, Lesson 3

by Jeff Potash

Overview of Contents

Lesson 3 contains two computer “hands-on” simulations designed to introduce students to the basics of how credit card interest charges work. Relatively high interest charges (e.g., 12 – 25% annual rates, with higher rates for first-time student users) are assessed monthly on unpaid balances AND credit card companies encourage minimum or partial payments. In this lesson students will experience how the costs of credit card borrowing can quickly escalate, sometimes beyond their control! The simulations offer two simple yet “real world” situations.

- Simulation 1 allows students to explore the implications of using different payment plans (Minimum Payment Due versus other regular payments) to repay a single \$500 bill. The size of one’s monthly payment affects both overall Interest costs and repayment time frames.

- Simulation 2 focuses on ongoing use of a credit card. In addition to interest costs and repayment, students making regular monthly charges are presented with the possibility of ballooning debt, driven both by new charges and increasing interest costs.

In each case, students will observe the results of different credit card use and payment strategies, including total interest costs and repayment times, plotted out over time in GRAPHS and TABLES.

Core Objectives for Lesson 3

(1) Managing a Credit Card.

Lesson 3 has two core take-home messages. Students must understand that (1) credit in the form of credit cards is DEBT. They are borrowing the credit card company’s money to pay their bills. Students must also understand that (2) CREDIT CARD DEBT (where not completely paid off each month) accrues INTEREST and that a “Minimum Payment Due” option is designed to maximize credit card company profits, at the students’ expense!

(2) How Compounding Interest (on a Debt) Works.

The system of compounding interest for loans is identical to that of SAVINGS, with one key difference: SAVINGS involves “my” money, while

Materials

- Computer Simulation (available online at http://www.clexchange.org/curriculum/dollarsandsense/DollarsandSenseII/ds2_lesson3.asp)
- Three handouts (use as needed) to record plans and results

CREDIT CARD DEBT is the credit card company’s money that I have borrowed. Hence, I earn interest on what is in my SAVINGS Account, while the credit card company earns interest (at a substantially higher rate than SAVINGS, it should be noted) on the UNPAID portion of my CREDIT CARD DEBT or loan.

(3) Using Models to Test Options.

The open-ended, hands-on focus on each simulation in Lesson 3 is designed to encourage students (1) to explore options and opportunities for evaluating different mental models, assumptions or decisions, and (2) to identify and explain to others a preference for one choice over others. At the core of this process is an important recognition that there is no single right answer for everyone.

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Behavior-Over-Time Graphs

by Alan Ticotsky

As we go into this summer of 2013, there is a lot going on in the Systems Thinking and System Dynamics world for K-12 education.

First of all, I would like to encourage you to take a look at the lessons available in the *Dollars and Sense II* module up on the website. Lesson 3 is the feature article in this issue of *The Exchange*. We are very excited about this venture into simulation and system dynamics conceptual learning. The eight *Dollars and Sense II* lessons, as well as our *Characteristics of Complex Systems* lessons, are all available as simulations on the website with their curricula. Check them all out!

We are pleased to announce that the 11th biennial Systems Thinking and Dynamic Modeling Conference will be held next summer, June 28-30, 2014, again at the Babson Conference Center in Wellesley, MA. It is worth coming for the food alone—not to mention the company of all the wonderful folks who will be there with you!

This summer there are two conferences of interest to educators: the International System Dynamics Conference and Camp Snowball. See more information and links in this newsletter.

We wish you all a relaxing and reviving summer, full of fun and learning.

Take care,
Lees
(stuntzln@clexchange.org)

Hard versus Soft Variables - It's the Shape That Matters

BOTGs are designed to represent our thinking. Some graphs display 'hard' variables, things that can be quantified. For example, scores on quizzes, number of homework assignments turned in, or recorded time running a mile. Other BOTGs represent 'soft' variables, such as confidence, satisfaction, enjoyment, and so on. All BOTG graphs allow our 'mental models' to take a visual form so we can share them, or analyze them ourselves. Almost all BOTGs, whether displaying hard or soft variables, are more insightful for their general shape and trend than the actual data points. Are we moving in the right direction?

Three or Four Questions Raised by BOTGs

After students draw their graphs, you can ask them to reflect on the implications of the information using one of these simple structures:

- Three simple questions to encourage action plans:
What? Describe the story the graph tells.
So what? Analyze what is causing the behavior, and what structures are producing the results.
Now what? Decide on a plan going forward and consider which aspects should be changed or encouraged.
- Slightly more sophisticated series of four questions to pose about change (or lack of change):
What is changing? Identify the variable being graphed.
How is it changing? Describe the trend or trajectory.

Why is it changing? Think about the causes and structures driving the behavior shown on the graph.

What is the significance? Consider what to do based on the information and insight gained.

Use these structures when talking with students, or ask them to write short answers in a reflection piece.

Two Variables can be Better than One

In addition to the insight gained by drawing a graph of a specific behavior, adding a second variable often increases the learning by an order of magnitude. Encourage students to draw a second line on their graphs, and both you and they may gain perspective on their achievement and learning.

For example, imagine if a student's performance graph shows a fairly flat line over the first few weeks of school. Then the line rises, representing steady linear increase since around Columbus Day. Ask him to think of a second variable to graph on the same pad, letting him know the scale may have to be different for the second line. Some possible variables include:

- Time spent on sports—maybe he finished playing on a soccer team and had more time for homework.
- Concentration in class—perhaps he changed his seat in class and distractions decreased.

While some of the insights might seem obvious or trivial, more often two lines on one graph push us to think about whether the variables are causal, correlated, or coincidental.

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Rather, there are options, trade-offs, and ultimately multiple pathways through which students can define and subsequently achieve personal financial goals.

Deeper Understanding of How the "System" Works

The conceptual tools of systems thinking help to visualize the dynamic process that unfolds over time. In the illustration of the actual model underlying each of the simulations in this lesson, students can see the following:

1. If their monthly payment is LESS than their total outstanding CREDIT CARD DEBT, the unpaid portion of the debt will incur a "New Monthly Interest" charge;
2. A Minimum Payment Due, calculated to equal the amount of "New Monthly Interest" and 1% of the existing CREDIT CARD DEBT, is designed to maximize the profits of the credit card company; and
3. Where Minimum Payment(s) Due are being made, additional new charges added monthly have the potential for growing CREDIT CARD DEBT.

Interest charged by the credit card company on the unpaid balance of a CREDIT CARD DEBT reflects the fact that one's use of a credit card involves "borrowing" the company's money to pay a bill. In choosing to make the Minimum Payment Due, the outstanding debt is subject to repeated monthly interest charges, all designed to maximize the company's profits.

to pay back a credit card debt when making minimum payments. For many, the shock of a large credit card bill ("Did I really spend that much?") is tempered by the company's reassuring option to make a relatively small payment. This exercise offers students the opportunity to discover how that option generates the greatest amount of interest payments benefiting the credit card company and playing to the advantage of the lender rather than the user. In offering alternative options, students can see how larger payments significantly reduce interest charges.

Introductions To Each Simulation

Following are brief introductions to each of the simulations, annotated versions of suggested student handouts, and possible follow-up questions and activities for extended learning opportunities.

SIMULATION 1: Can I Recreate Past Spending?

http://www.clexchange.org/curriculum/dollarsandsense/DollarsandSenseII/ds2_lesson3.asp

Simulation 1 is designed to get students to see just how long it takes

The simulation is preset to explore the repayment of an outstanding \$500 CREDIT CARD DEBT. It can be customized:

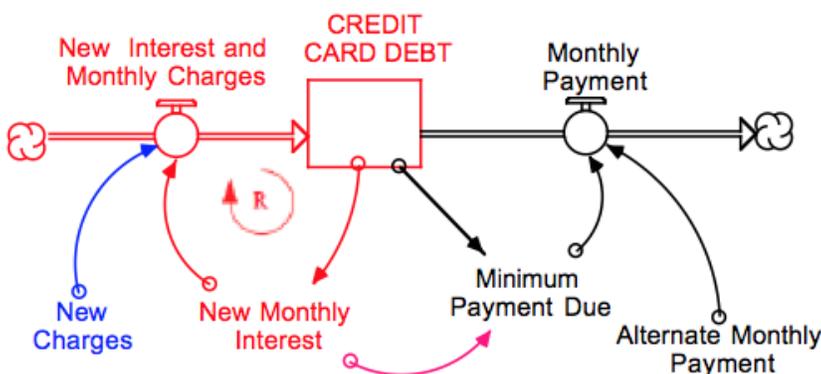
- to look at debt up to \$750;
- with Interest Rates from 5% to 30%;
- to make Minimum Payments; or
- to make a Set Monthly Payment up to \$100.

SIMULATION 1 HANDOUT with ANSWERS and GUIDES FOR TEACHERS

Managing My First Credit Card

1. Open the Simulation, read the Introduction, and summarize your task below.

It is important that students understand (and can explain) the learning objective for using Simulation 1: the task is to explore different repayment options for paying back a \$500 CREDIT CARD DEBT (or bill).



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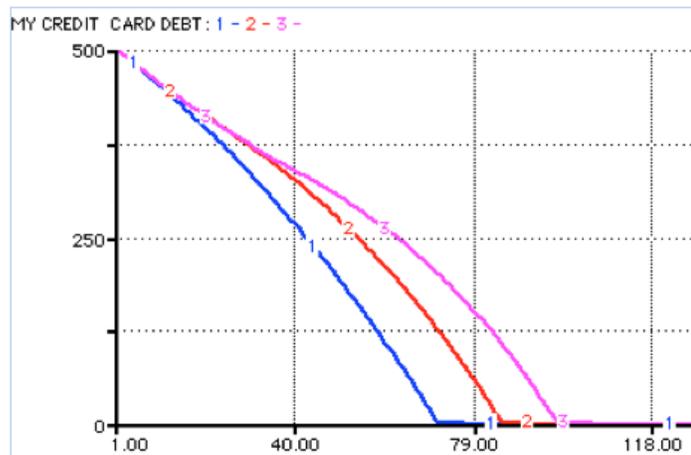
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2. Go next to the CONTROL PANEL to consider the credit card company's generous Minimum Payment Due option, which involves paying only \$10 a month. Define your Initial CREDIT CARD DEBT as \$500, and run the simulation three times, assuming the different credit card Interest Rates below. Record the results.

Annual Interest Rates Charged	12%	18%	24%
Months To Pay Off Bill	71	85	97
Total Interest Paid	\$196.16	\$364.97	\$553.88

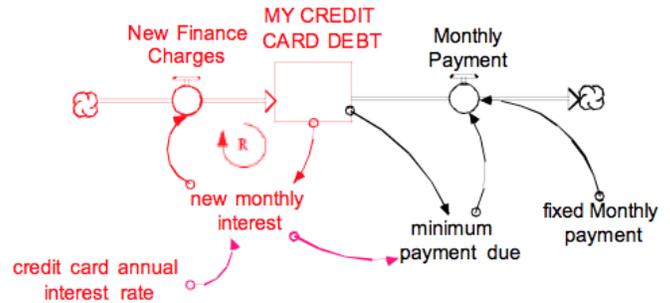
What should be clear in each case from the GRAPH page is that INTEREST matters! Even a credit card with a relatively low interest rate (12%) tacks on almost 40% interest premium for "borrowing" credit card company money and involves making payments for almost 6 years. But where that rate is doubled (24%)—not at all unusual for cards given to 18 year olds—interest payments EXCEED the amount borrowed, and lock in payments for 8 years!



How is this possible? The TABLE tells the story: for every month that there is an UNPAID balance, interest charges are added. Thus, at the beginning when the unpaid balance is the highest, a significant portion of the monthly payment goes toward paying new interest. This obviously benefits the credit card company!

A powerful way for students to visualize what is happening is to think in terms of SYSTEMS. As the illustration indicates, ongoing (or current) CREDIT CARD DEBT is influenced both by payments (which reduce or potentially eliminate the debt), followed by finance charges involving

the INTEREST charged on the remaining UNPAID debt (balance). And since interest is charged monthly, it follows that less interest will accrue where payments exceed the minimum. This concept is explored in Simulation 2.



3. Next, using the 18% annual interest rate (common for student credit cards), increase your monthly payments by increments of \$10 a month and record the results below.

Fixed Monthly Payment Set at	\$20	\$30	\$40
Months To Pay Off Bill	34	21	15
Total Interest Paid	\$130.92	\$79.12	\$57.14

In contrast to the 85 months and \$364.97 in interest generated by choosing the \$10 Minimum Payment Due option, adding a relatively small sum of \$10 extra (creating a total payment of \$20) cuts time and interest paid by almost two-thirds; lesser (but not insignificant) benefits further accrue with additional \$10 increments. The point: it may not be necessary to pay the ENTIRE bill to reap major benefits over the Minimum Payment Due option. Have the students think about this option!

Of the monthly repayment options you've considered (for a credit card charging 18% interest), which is your FAVORITE? Why?

In asking students to identify a favorite, we are asking them to think about what matters most to them: Is it the size of the monthly payment? Total repayment time? It is likely that students will make different choices, based on different trade-offs. This concept is a positive because it challenges them to be clear in their explanations about what matters most to them.

4. What are the key “take-home” messages you’ve learned about credit cards?

The goal in this basic exercise is to make clear that credit card borrowing is DEBT, and unpaid DEBT generates INTEREST CHARGES (in this case, each month). Beyond that concept, the ingenious nature of the Minimum Payment Due option needs to be understood as maximizing the interests (and interest!) of credit card companies. Selecting other payment options does make a significant difference!

SIMULATION 2: Managing Ongoing Use of a Credit Card

http://www.clexchange.org/curriculum/dollarsandsense/Dollars and Sense II/ds2_lesson3.asp

As a follow-up to Simulation 1, Simulation 2 seeks to extend students’ appreciation of the further complications and potential dangers in making minimum or small payments while incurring ongoing new monthly charges. While the underlying compounding system behind interest charges reflects the basic logic of a Savings Account, this simulation illustrates how the potential exists for increased debt, translating into still higher interest charges, and the very real possibility of piling up credit card bills to the credit card limit.

The simulation is preset to explore the repayment of credit card debt based on \$50 regular monthly use and a \$1,000 credit card limit. It can be customized:

- to look at a limit up to \$1,500;
- with Interest Rates from 5% to 25%;
- with Monthly Charges up to \$100;
- to make Minimum Payments; or
- to make a Set Monthly Payment up to \$100.

SIMULATION 2 HANDOUT with ANSWERS and GUIDES FOR TEACHERS

How Do I Manage Ongoing Credit Card Use?

1. Open the Simulation, read the Introduction, and summarize your task below.

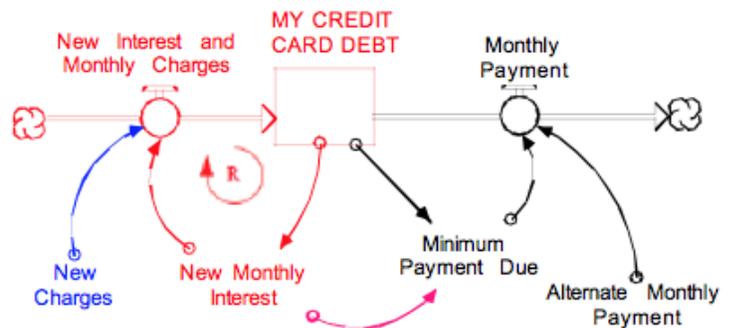
It is important that students understand (and can explain) the learning objective for using Simulation 2. The task is to explore different repayment options (Minimum Payment Due or a larger Fixed Amount) when regularly using a credit card to charge \$50 each month.

2. Go to the CONTROL PANEL and set the Average Monthly Charges at \$50 (leave the other two sliders where they are). What do you expect will happen if you pay only the Minimum Payment Due?

Asking students to predict what will happen requires them to identify their assumptions and share their “mental models.” This is always useful when subjecting their assumptions to careful scrutiny.

Run the simulation. Were you right? Explain why or why not.

Where credit card use is ongoing AND a minimum payment is LESS than the additional \$50 being added to the card debt each month, that DEBT will grow until it reaches one’s CREDIT LIMIT (in this case, after 22 months). Here again, it may be useful for the students to visualize what is happening in the system: minimum payments do NOT take into consideration next month’s INCOMING charges—they are solely based on the interest calculated on the previous month’s balance PLUS 1% of that balance. Any new charges must be factored into one’s monthly payment to guarantee that one’s DEBT does not grow. Having one’s credit card use DENIED (for lack of available credit, i.e., exceeding the credit limit) may be embarrassing the first time it happens. But if it happens repeatedly and the credit card company chooses to SUSPEND your card’s use and also insist that you repay your debt in full, you have a much greater problem. And failure to repay the credit card company may jeopardize future options for obtaining any kind of credit (for education, a car, a home, etc.).



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3. Explore options for using one of two alternative payment plans.

- A. Pay the Minimum Payment Due PLUS an additional sum of ___ each month; or
- B. Pay a set alternative sum of ___ each month.

Try different options. Run the simulation multiple times until you have at least 2 successful plans. Identify each below, then select your favorite and explain why.

Payment Plan 1:

Minimum + \$_____ OR alternative sum of \$_____ a month

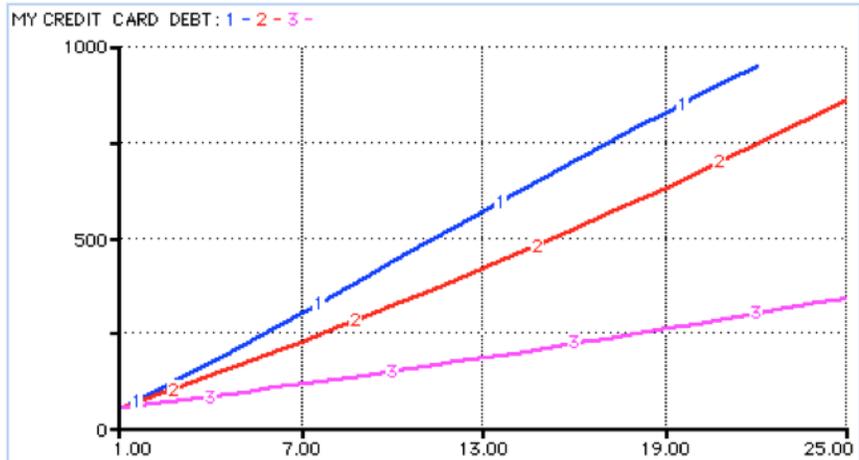
Payment Plan 2:

Minimum + \$_____ OR alternative sum of \$_____ a month

Select your favorite plan and explain why it is your favorite.

Having run the second simulation, students should be encouraged to think about what they have learned. Balancing the credit card account each month means that monthly payments must equal the \$50 they are spending. That means they will need to pay an ALTERNATIVE SET MONTHLY PAYMENT of \$50. In this case, the simulation will “flat line” at zero.

But they do have a \$1,000 credit limit, which means that if their regular monthly payments total at least \$22, they will accumulate debt but, after 24 months, still be within their credit limit (with \$863 in CREDIT CARD DEBT). Do they want to be “on the edge?” Or perhaps, with a payment of \$40 a month, they can comfortably keep interest payments at a minimum. That’s their decision!



- Run 1 Minimum Payment Due (\$10/month – exceed \$1,000 limit in Month 22)
- Run 2 (\$22 Monthly Payment - \$863 Debt after 24 months, paid \$141 in interest)
- Run 3 (\$40 Monthly Payment - \$343 Debt after 24 months, paid \$50 in interest)

4. Reset the Interest Rate at 25% and repeat #3.

- A. Pay the Minimum Payment Due PLUS an additional sum of ___ each month; or
- B. Pay a set alternative sum of ___ each month.

Try different options. Run the simulation multiple times until you have at least 2 successful plans. Identify each below, then select your favorite and explain why.

Payment Plan 1:

Minimum + \$_____ OR alternative sum of \$_____ a month

Payment Plan 2:

Minimum + \$_____ OR alternative sum of \$_____ a month

Select your favorite plan and explain why it is your favorite.

The basic dynamics remain the same here. What changes is the minimum amount the student must pay each month to PREVENT CREDIT CARD DEBT from reaching the \$1,000 limit: a \$22 monthly payment no longer works. Now they must make a minimum \$25 monthly payment. This illustrates the power of compounding interest on the unpaid balance!

5. What is the most important lesson you’ve learned about credit card interest?

Interest Rates matter a lot. But so do monthly payments, since the difference between payments and new charges/interest leads to a GROWING debt. And whereas the repayment of a single debt is guaranteed each month to reduce one’s total debt, the addition of new monthly charges changes that completely. Care

must be taken to balance payments with new charges and interest, so that a growing stock of DEBT (their money, not yours) will not generate high INTEREST CHARGES (for you, not them).

SUMMARY CHALLENGE

Students are encouraged, after completing each of the simulations, to apply what they have learned to explain how either they or others they know can use credit cards without incurring unexpected interest charges. (Suggested written options are included with the handouts.) This challenge requires students to ground their understanding of how the system of credit card interest works with realistic decisions regarding where, when, and how they can responsibly use and enjoy the benefits of credit cards (convenience, building a credit record). Sharing their credit card plan engages others in constructive discussion of options and choices.

SUMMARY CHALLENGE HAND-OUT with GUIDES FOR TEACHERS

Summary Challenge (after completing the lesson)

Pick #1 or #2 and write your answer in the space below (attach a graph or table, if desired).

1. You will most certainly, if you haven't already, be inundated with offers for a "free" credit card. Based upon what you've learned in this lesson, describe where, when, and how you will accept one or more offers and use the card(s) to work for you. Include concerns you might have about how you'll manage your credit needs.
2. Do you know anyone who either has had problems or might have problems managing their credit?

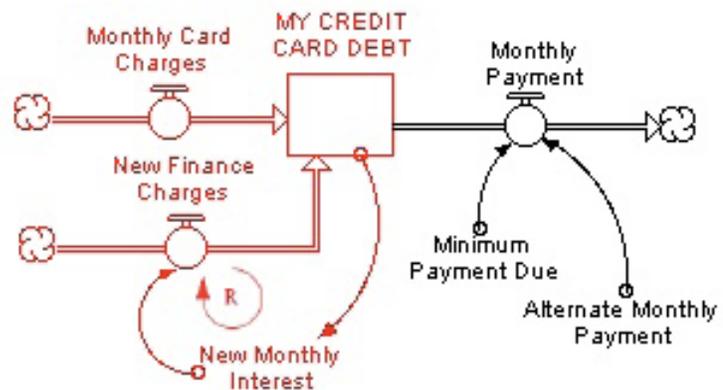
Based on what you've learned, how might you help or advise them? Explain clearly how and why they will listen to you.

In this final exercise, students are challenged to apply what they've learned, either in identifying how they personally or others they know can effectively manage a credit card.

Credit cards offer tremendous convenience for making purchases. But that convenience must be balanced with a core recognition that unpaid credit card balances constitute

personal debt. Convenience too often obscures the reality that credit cards are poor instruments for carrying long-term debt, given their normally high interest rates. Too often, credit card users realize this after they have incurred sizeable balances, based on large and/or frequent purchases.

Everyone can and should be able to understand that credit card companies offer minimum payments to support their bottom line (maximizing interest payments). Students should be able to explain this to others and apply it themselves.



The handouts for Lesson 3 are available on the CLE website.

Dollars and Sense II: Our Interest in Interest challenges students to use systems thinking and mathematical tools to develop a realistic and personal understanding of the dynamics of compound interest.

Each lesson includes teacher/parent instructions and student worksheets. The materials include Instructor Guides and Student Worksheets. By encouraging students to explore a diverse set of financial situations, the Guides and Worksheets further support student learning in four different ways.

- Learn by doing (constructivism): asking open-ended "what if" questions and using meaningful real-world examples.
- Learn by building a conceptual foundation: connecting important mathematical skills and tools (tables, graphs) with a systems thinking conceptual framework. This framework visually represents dynamically changing financial "systems" (e.g., a personal savings account).
- Learn by challenging preconceptions: discovering, by using computer simulations, that there is more than one right "answer" or way to successfully manage one's finances.
- Learn by sharing, comparing, collaborating, and applying the lessons to meaningful personal financial problems.

Camp Snowball

Now Is the Time to Register!

www.campsnowball.org



July 22-26, 2013

Wake Forest University
Winston-Salem, NC

To thrive in a changing world, our kids need to think in systems... and act for a healthy future.

That's why we created Camp Snowball—a summer “camp” experience that brings together students, parents, educators, and business and community leaders in order to build everyone’s capacity for learning and leading in the 21st century.

Don't miss this opportunity to explore new ways of teaching and learning that offer students a chance to develop the critical thinking skills they need to meet the challenges their futures hold.

In-depth core modules help you focus your participation and give you practical skills and tools you can use as soon as you leave. You'll choose one from the following Core Modules (visit www.campsnowball.org for complete descriptions):

For Adults and Students

- An Introduction to Systems Thinking for Elementary Schools
- An Introduction to Systems Thinking for Secondary Schools
- Embracing the Power of Visual Tools: Next Steps in Systems Thinking
- An Introduction to Education for Sustainability
- The Train Is Leaving the Station: Connecting Systems Thinking and STEAM
- Nature as Context for Learning Science
- Finding Our Way to the “A” in STEAM: Art as Stimulus in Your Common Core Classroom

For Adults

- Practical Applications of Systems Thinking for Building Leaders
- Leading Change in School Systems (for School Administrators and Board Members)
- Teacher as Designer: Structures To Support Learning in Classrooms
- No Student Too Young: Education for Sustainability and Systems Thinking for Early Childhood Educators

For Students

- Innovating for a Healthy Future

Plus, you'll also participate in a wide range of other activities from enrichment sessions, to field trips, to the project marketplace where you can share the work that you are doing. Special guest adult and student provocateurs will share new and different perspectives and ideas. You'll meet others grappling with the same challenges, and support each other in finding new approaches that really work. It's a week full of formal and informal learning, new experiences, colleagues, and yes—it's definitely fun!

Camp Snowball 2013 will be held on the beautiful campus of Wake Forest University. Registration rates include all meals beginning with dinner on Monday, July 22 through dinner on Friday, July 26. College housing at WFU and transportation are additional.

Register now at www.campsnowball.org!

The Zen of System Dynamics

by Richard Turnock

Like Zen, System Dynamics is difficult to define. They share many things in common. While they do not dispense completely with words and writing, Zen and System Dynamics have no dependence on words. System Dynamics models use levels and flows shown as rectangles and pipes on the computer. These are the only two concepts needed to understand why systems work the way they do (Forrester, 1996).

Zen passes from mind to mind outside the approved curriculum, culture and doctrines. System Dynamics also has a history of passing from mind to mind, outside the approved curriculum in K-12 education. Education reform culture and doctrines require standardized tests, teacher evaluations based on test scores and for-profit education companies. System Dynamics has been taught to K-12 teachers outside the approved University curriculum for teachers by those who have mastered the concepts as taught to them by the international experts in System Dynamics.

Zen points directly at the mind. Zen Koans engage the minds of students to resolve a dilemma. System Dynamics points directly at the mental models each of us has in our mind of how we believe the real world works and compares this to dynamic model simulations on a computer. System Dynamics engages the minds of students to resolve the conflict between their own mental model and results of the computer simulations.

Zen is a way of practicing insight to improve our capacity and ability to resolve real dilemmas and live an authentic life. System Dynamics is a way of practicing insight to improve our capacity and ability to

communicate our mental models, computer simulation results, and conclusions and decisions to others. Miscommunication results from incongruent communication by one or more parties to a conversation when their mental model does not align with their words or the mental models of others. System Dynamics resolves these dilemmas by engaging everyone in meta-communication about the conflict between the mental models and computer models.

Zen teachings are communicated using short stories and epigrams. Hakuin Ekaku (January 19, 1686 - January 18, 1768) was one of the most influential figures in Japanese Zen Buddhism. Here is the Koan he originated:

“You know the sound of two hands clapping; tell me, what is the sound of one hand?”

The student has no dependence on any other words, writing or instruction. The Koan is outside the public education curriculum. The epigram points directly at the mind of the student.

Dynamic models of systems do not depend on any other words or instruction. The dynamic model is outside the public education curriculum focused on standardized test results. A model is an epigram in symbols that points directly at the mind of the observer.

A System Dynamics Koan might be:

“You know how a bathtub works; tell me, how does self-esteem work?”

System Dynamics students have to identify their mental model of how a bathtub works. If they haven't already, they build a dynamic model and simulate a bathtub. They research how

a bathtub works and enter the proper assumptions and equations into the model. They communicate the results and receive feedback. They repeat their steps until they resolve the dilemma of the differences between their mental model and how a bathtub actually works based on a valid and verified dynamic model simulated on the computer. Just like in Zen, learning happens when the students change their mental model.

This takes a lot of inner work. Just as in Zen, the focus is on what is going on in the mind. Seeing the mental model align with the computer simulation model, so that the students change their mental model, is like the “Ah, ha!” moment in Zen when a student gains insight into a Koan.

Understanding a Koan requires digging deeper and thinking beyond the words. Understanding a System Dynamics model requires finding balancing and reinforcing feedback loops, shifting loop dominance and time delays. Understanding a Koan or a dynamic model requires insight that does not depend on words, is transmitted outside the standard curriculum and points directly to the mind.

Insight into how the mind works is the path to enlightenment in Zen. Insight into how to change our mental models using dynamic model simulations on the computer is the path to learning using System Dynamics.

REFERENCE

Forrester, Jay W. “System Dynamics and K-12 Teachers.” Creative Learning Exchange. 30 May 1996. Web. 11 Feb. 2012. <http://clexchange.org/ftp/documents/Roadmaps/RM1/ D-4665-5.pdf>

The 31st International Conference of the System Dynamics Society

Cambridge, Massachusetts USA

July 21 – July 25, 2013

Creating the Future from Within

The annual System Dynamics conference brings together people from around the world to share important research and application results and to build the community of those active in the field. For 2013, we return to the Cambridge-Boston area, just minutes from MIT where Jay Forrester conducted his groundbreaking work. The conference, with a theme of *Creating the Future from Within*, will emphasize prospective studies with a focus on internally generated dynamics.

There will be plenary presentations showcasing important work in the field, along with parallel and poster sessions, making available the most

current research, applications, and work in progress. There is a full day of skill-building workshops covering a range of topics from basic software use to advanced analysis techniques.

In addition, there will be panel discussions, special interest group sessions, student colloquia, the modeling assistance workshop, cultural events, vendor displays, exhibits, demonstrations, Society business meetings, and other related activities. The conference schedule will provide time for relaxed social and professional interaction.

For more information, please see www.systemdynamics.org or email conference@systemdynamics.org.

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- On the website at www.clexchange.org
- In paper format via US mail (\$15.00 outside the USA)

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If you would like to invest in our effort here at *The Creative Learning Exchange*, your contribution would be appreciated. You may donate any amount you wish; perhaps \$50.00 is a reasonable amount for a year. All contributions are tax-deductible.

Enclosed is _____ to *The Creative Learning Exchange* to help invest in the future of K-12 systems education.

Name _____

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THANK YOU!

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