

Teaching and Learning: Practices for Success

Rangaraj M. Rangayyan

Professor Emeritus of Electrical and Computer Engineering

University of Calgary, Calgary, Alberta, CANADA

ranga@ucalgary.ca

people.ucalgary.ca/~ranga



**UNIVERSITY OF
CALGARY**



UNIVERSITY OF
CALGARY

Lord Brahma: The Creator of Everything





UNIVERSITY OF
CALGARY

The Omniscient Guru: Knowledge is Supreme!

गुरुर्ब्रह्मा गुरुर्विष्णु गुरुर्देवो महेश्वरः
गुरु साक्षात् परब्रह्मा तस्मै श्रीगुरवे नमः

Guru Brahma Guru Vishnu Guru Devo Maheshvaraha
Guru Sakshat Para Brahma Tasmai Sri Gurave Namaha

My Guru represents the Holy Trinity of Lord Brahma,
Lord Vishnu, and Lord Shiva.

My Guru creates, promotes, and grants knowledge.

My Guru destroys ignorance. I salute my Guru.



UNIVERSITY OF
CALGARY

Goddess Sarasvati: Vagdevi, Vidyadani



<https://triangulations.wordpress.com/2010/01/18/hindu-gods/saraswati/>

Prayer to Goddess Sarasvati

ऐं ह्रीम् ओम् सरस्वत्यै नमः Eim Hrim Om Sarasvatyai Namaha

ॐ सरस्वति नमस्तुभ्यं वरदे कामरूपिणि । विद्यारम्भं करिष्यामि सिद्धिर्भवतु मे सदा ।

*Om Sarasvati Namastubhyam Varade Kamarupini
Vidyarambham Karishyami Siddhir Bhavatum Sada*

ॐ श्री सरस्वत्यै नमोनमः Om Sri Sarasvatyai Namonamaha

O Goddess Sarasvati, I offer my salutations to you

You fulfill the wishes of your devotees

I am beginning my studies

Please bless me so I may achieve my goals



UNIVERSITY OF
CALGARY

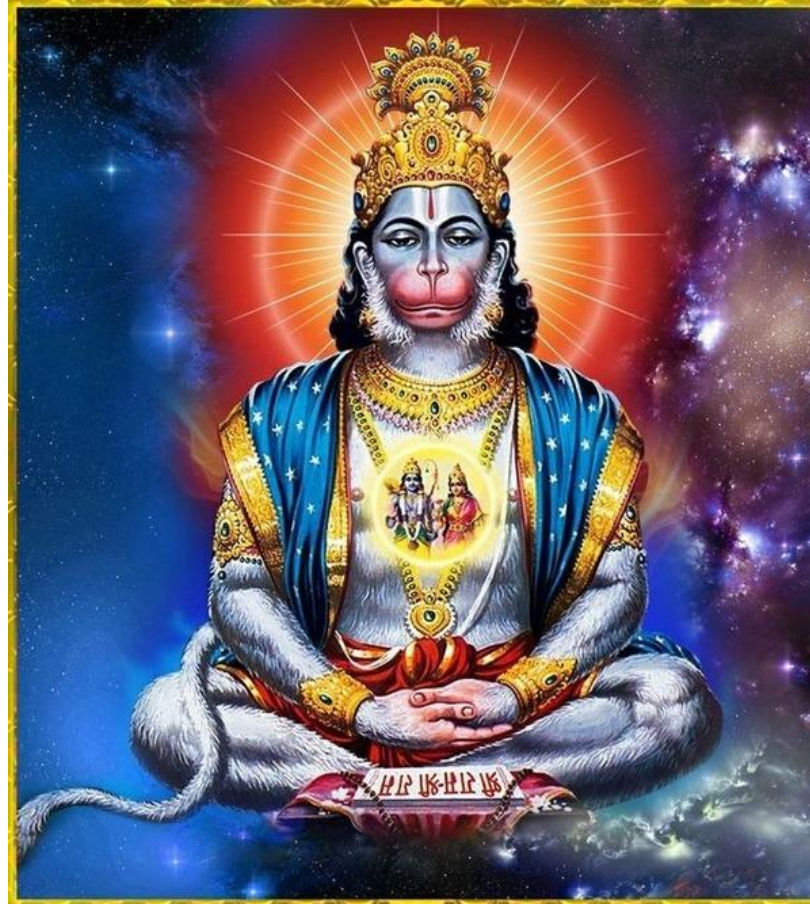
Ishta Devata: Personal Deity Lord Hanuman

जय हनुमान
ज्ञान गुण सागर।

...

महावीर बिक्रम
बजरंगी।
कुमति निवार
सुमति के
संगी।। ...

विद्यावान गुनी
अति चातुर।...



Glory to Hanuman!
You are an ocean of
knowledge and good
qualities...

You are brave and
victorious with the
strength of
diamonds; you dispel
bad thoughts and
support good
minds...

You possess great
knowledge and
qualities; you are
extremely
intelligent...



UNIVERSITY OF
CALGARY

Ishta Devata: Personal Deity Lord Ganesha, Vidya Ganapati

वक्रतुण्ड
महाकाय
सूर्यकोटि
समप्रभ ।

निर्विघ्नं
कुरु मे देव
सर्वकार्येषु
सर्वदा ॥



Vakratunda
Mahakaya Suryakoti
Samaprabha
Nirvighnam
Kuru Me Deva Sarva
Karyeshu Sarvada

O Lord Ganesha: the
one with a curved
trunk, a great body,
and the brilliance of
a million Suns;
please keep all of my
work free of
obstacles always and
lead me to success



UNIVERSITY OF
CALGARY

The Omniscient Guru: Knowledge is Supreme!

From the Taittiriya Upanishad:

मातृ देवो भव। पितृ देवो भव।
आचार्य देवो भव। अतिथि देवो भव॥

Mathru Devo Bhava | Pithru Devo Bhava |
Acharya Devo Bhava | Atithi Devo Bhava ||

Honor thy Mother as God. Honor thy Father as God.
Honor thy Teacher as God. Honor thy Guest as God.

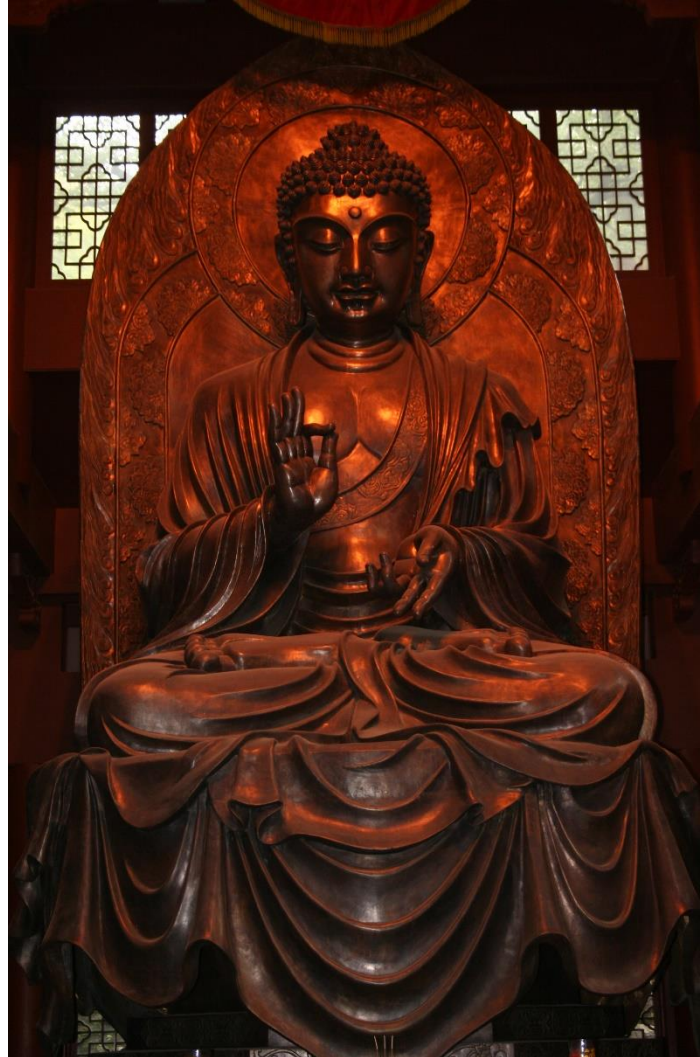


UNIVERSITY OF
CALGARY

Lord Buddha: The Ultimate Teacher!

बुद्धम
शरणम
गच्छामि

Buddham
Saranam
Gacchami



O Blessed One,
Shakyamuni Buddha

Precious treasury of
compassion

Bestower of supreme
inner peace...

Please give me the
light of your wisdom
To dispel the darkness
of my mind
And to heal my mental
continuum...

<https://www.xavier.edu/jesuitresource/online-resources/prayer-index/buddhist-prayers>



Wisdom is Supreme!

Prajnanam Brahma प्रज्ञानम् ब्रह्म

Mahavakya or Great Saying from the
Aitareya Upanishad of the Rig Veda

- ❖ Knowledge is Infinite
- ❖ Intelligence is The Absolute
- ❖ Wisdom is The Highest Truth
- ❖ Consciousness is The Ultimate Reality



Symbolism of the Lotus



- ❖ The lotus draws nutrition from muddy and unclean water: selecting information from clutter and noise
- ❖ The lotus represents purity, spiritual awakening, expansion of one's soul and mind, intelligence, wisdom, knowledge, enlightenment, and the apex of achievement



UNIVERSITY OF
CALGARY

My School Prayer at St. Joseph's Convent

Oh, My God!

We Are About to Study

Grant Us Thee Thy Blessings!



Patron Saints for Education

- ❖ St. Thomas Aquinas: patron of catholic universities, colleges, schools, and students
- ❖ St. Jean-Baptiste de la Salle: patron saint for education and teachers
- ❖ St. Catherine of Alexandria: patron of students, teachers, and librarians
- ❖ St. Joseph of Cupertino: patron of students taking exams



UNIVERSITY OF
CALGARY

A Student's Prayer by St. Thomas Aquinas

Come, Holy Spirit, Divine Creator, true source of light and fountain of wisdom!

Pour forth your brilliance upon my dense intellect, dissipate the darkness which covers me, that of sin and of ignorance.

Grant me a penetrating mind to understand, a retentive memory, method and ease in learning, the lucidity to comprehend, and abundant grace in expressing myself.

Guide the beginning of my work, direct its progress, and bring it to successful completion.

This I ask through Jesus Christ, true God and true man, living and reigning with You and the Father, forever and ever.

Amen.



Deities of Knowledge

- ❖ Manjushri: bodhisattva of wisdom
- ❖ Kong Zi: Confucius, sage of education and culture
- ❖ Lao Zi: Taoist sage of wisdom
- ❖ Minerva: Roman goddess of wisdom
- ❖ Athena: Greek goddess of wisdom
- ❖ Omoikane: Shinto god of wisdom and intelligence
- ❖ Tenjin: Shinto god of scholarship and learning
- ❖ Saga: Norse goddess of wisdom
- ❖ Isis: Egyptian goddess of wisdom



Dua for Students

Oh God, please bring me out of the darkness of doubt and favor me with the light of comprehension

Oh God, open to us the doors of your mercy and unfold for us the treasure of your knowledge by your mercy

Oh the most merciful of the merciful ones

Dua is the act of supplication; asking or begging for something earnestly or humbly
Dua before class From Khulalasadul Adhkaar: <http://www.duas.org/student.htm>



The Nature of Knowledge

Knowledge is

- ❖ Vast
- ❖ Evolving
- ❖ Expanding
- ❖ Rapidly changing
- ❖ Getting more complex
- ❖ Perpetually challenging!



Teaching Includes Learning!

- ❖ Teaching requires learning
- ❖ Teaching involves learning
- ❖ Teaching stimulates learning
- ❖ Teaching promotes learning
- ❖ Learning is never ending
- ❖ Learning is a life-long venture!



Be Prepared!

- ❖ Yearn to be at the forefront of knowledge!
- ❖ Be humble and approach with humility
- ❖ Recognize what you know and do not know
- ❖ Be progressive
- ❖ Be agile and adaptive
- ❖ Be prepared for hard work!
- ❖ Gain first-hand experience
- ❖ Maintain passion for teaching and learning



Paths for Learning

- ❖ The Three 'R's: Reading, 'riting, 'rithmetic
- ❖ Listening with Intention and Attention
- ❖ Comprehension, Understanding, Internalization
- ❖ Improvement via Repetition: Sadhana, Riyaz
- ❖ Memorization: Retention of Knowledge
- ❖ Exercises of Application: Solving Problems
- ❖ Preparation of New Material
- ❖ Innovation, Creativity, Originality



Appearance Matters!

- ❖ Be punctual
- ❖ Exude enthusiasm!
- ❖ Wear neat and appropriate attire
- ❖ Maintain a pleasant attitude
- ❖ Possess emotional strength and stability
- ❖ Be passionate!
- ❖ Be well-organized
- ❖ Start every meeting with a warm greeting!



Projection

- ❖ Possess authority on the subject matter
- ❖ Project genuine confidence!
- ❖ Express yourself with clarity
- ❖ Be convincing in your presentation
- ❖ Share knowledge freely with enthusiasm
- ❖ Maintain control over the situation
- ❖ Be uplifting and not demeaning
- ❖ Connect with the real world and real life



Professionalism

- ❖ Be authentic
- ❖ Be knowledgeable
- ❖ Develop good communication skills
- ❖ Use only clean and appropriate humor
- ❖ Be strict
- ❖ Be firm
- ❖ Make no pretensions
- ❖ Make no loose promises



Say NO to Casualness!

Professionalism requires
respecting boundaries

- ❖ NO casual attitude
- ❖ NO informal relationship
- ❖ NO intimate connection
- ❖ NO personal affection
- ❖ NO physical intimacy



Engagement

- ❖ Maintain human connection
- ❖ Show empathy
- ❖ Be compassionate
- ❖ Be creative
- ❖ Be innovative
- ❖ Demonstrate genuine multicultural sensitivity
- ❖ Express gratitude and say “Thank You!”
- ❖ Practice and inculcate life-long learning



Commitment and Dedication

- ❖ Teaching and learning require commitment of time, energy, and matter (resources)
- ❖ Dedication of effort is absolutely necessary
- ❖ Prayer, meditation, and self-actualization help in realizing commitment and dedication
- ❖ Commitment and dedication amplify the drive to teach and learn
- ❖ Commitment and dedication lead to improved results and increased gains



Benefits of Self-Actualization

- ❖ Realization of one's potential
- ❖ Personal development, growth, discipline
- ❖ Creativity and achievement
- ❖ Confidence and self-esteem
- ❖ Sense of belonging to society
- ❖ Positive contributions to society
- ❖ Acceptance, admiration, and respect



Noteworthy Notes

- ❖ Prepare and provide well-organized notes
- ❖ Start with a general introduction to show a broad picture of the subject matter
- ❖ Follow a natural easy-to-difficult sequence
- ❖ Include real-life and real-world examples
- ❖ Provide easy-to-understand illustrations
- ❖ Do not withhold presumably difficult material



Give Freely!

- ❖ Give appropriate learning material unconditionally
- ❖ Do not withhold relevant material
- ❖ Do not hold back supposedly difficult matter
- ❖ Create new, original, and novel material suited to the learners' interests and capabilities
- ❖ Give links to additional material at reputed sources of advanced learning
- ❖ Knowledge is not just for you: it is for everyone!



Invigorating Exercises

- ❖ Present a few easy questions to encourage and verify reading of the notes provided
- ❖ Provide numerical problems when possible
- ❖ Give exercises that challenge the learner's comprehension of the material
- ❖ Pose tough questions that test the limits of the learners' knowledge
- ❖ Use real-life and real-world situations wherever possible



Perspectives on Learning

- ❖ Focus on the fundamentals
- ❖ Emphasize theoretical knowledge
- ❖ Learn to solve real-world problems
- ❖ Be open for multiple paths and outcomes
- ❖ Endeavor to be creative
- ❖ Strive to be original: lamp versus mirror!
- ❖ Develop skills to explore and innovate
- ❖ Build teams to work together
- ❖ Be a life-long learner



Levels of Knowledge

- ❖ Basic knowledge
- ❖ Fundamental knowledge
- ❖ Theoretical knowledge
- ❖ Focused knowledge
- ❖ Application-based knowledge
- ❖ Practical knowledge
- ❖ Broad-based knowledge
- ❖ Expert knowledge



Desired Personal Traits of a Good Teacher and Learner

- ❖ Recognize your strengths and limitations
- ❖ Develop good interpersonal skills
- ❖ Be open for collaborative team work:
be a part of the whole
- ❖ Be open to asking questions
- ❖ Reply to questions in simple and clear terms
- ❖ Appreciate the contributions of colleagues
- ❖ Respect professional boundaries



Onward and Upward!

- ❖ Maintain integrity
- ❖ Impart high-quality education
- ❖ Commit to enhancement of standards
- ❖ Promote multilingualism
- ❖ Develop multidisciplinary skills
- ❖ Practice cultural sensitivity
- ❖ Encourage societal engagement



Successful Teaching and Learning

- ❖ Read and listen with comprehension
- ❖ Build a solid fundamental knowledge base
- ❖ Possess clear and in-depth theoretical knowledge
- ❖ Learn practical and multidisciplinary applications
- ❖ Sharpen your critical thinking abilities
- ❖ Speak persuasively
- ❖ Communicate effectively: write with precision
- ❖ Cultivate professional behavior



Let Go of Your Ego!

- ❖ Be ready for positive and negative reactions
- ❖ Be prepared for tough questions
- ❖ There are no stupid questions:
Only stupid answers!
- ❖ Watch out for ego-boosting and ego-busting events and situations!
- ❖ Control your temper: Be calm and equanimous
- ❖ Practice patience, patience, patience!



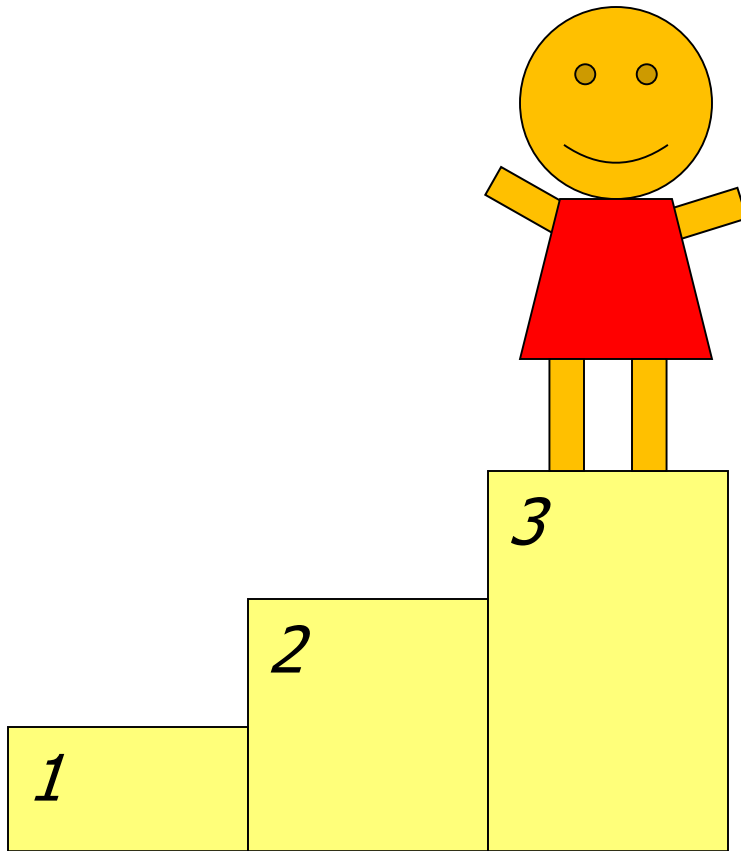
Before and After Me

- ❖ There have been many great teachers and learners before me
- ❖ Isaac Newton: "If I have seen further it is by standing on the shoulders of giants"
- ❖ There will be many more great teachers and learners after me
- ❖ May the next generation of learners attain even higher levels of knowledge
- ❖ This is the way to increase and improve our collective consciousness



UNIVERSITY OF
CALGARY

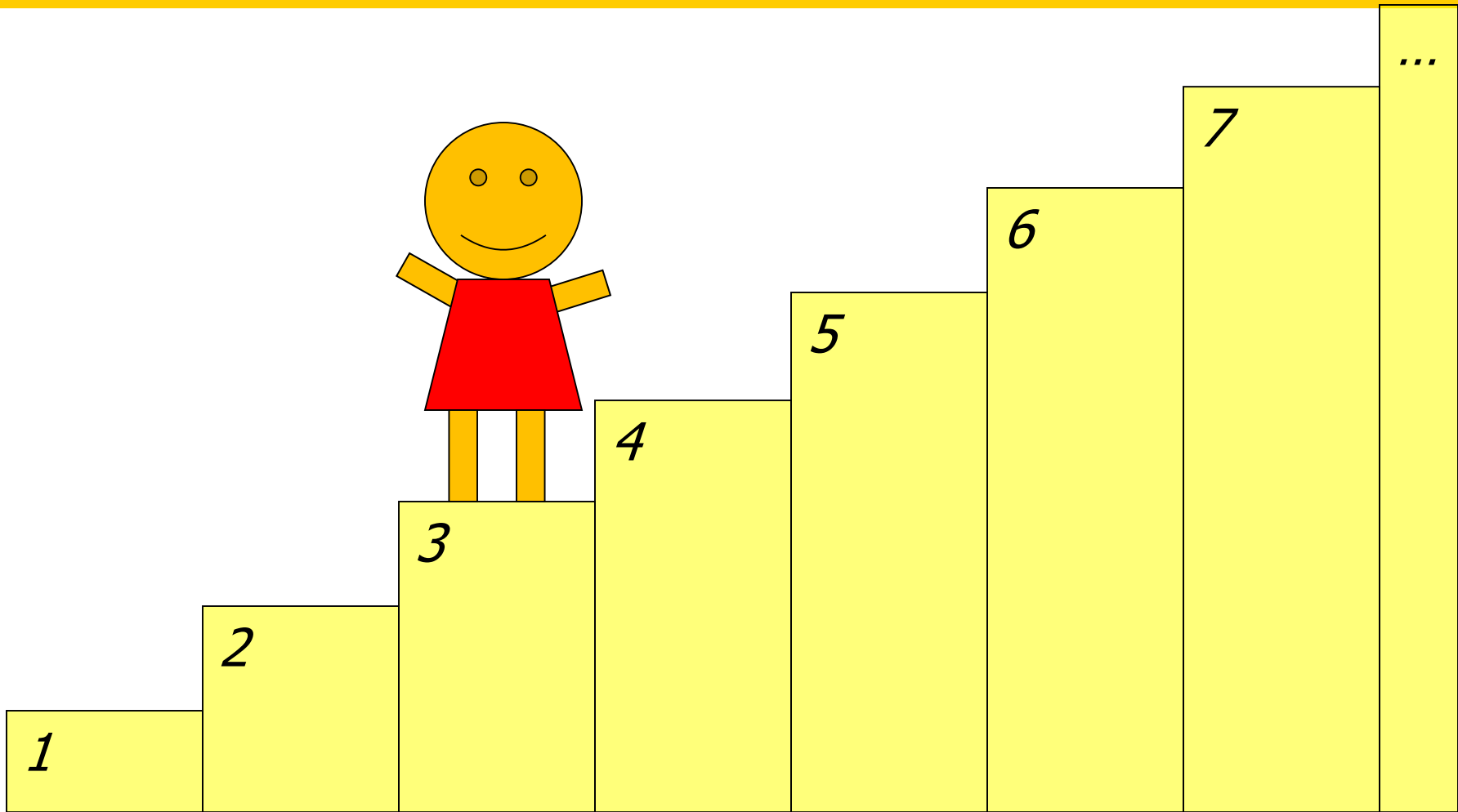
A Never-ending Path!





UNIVERSITY OF
CALGARY

A Never-ending Path!





Sir MV's Words

Sir Mokshagundam Visvesvaraya (1861–1962):

Indian Engineer, scholar, Bharat Ratna

His birthday, 15th September, is **Engineers' Day**



"Success in life depends on action, that is, on what you do, and not what you feel or think, and the price of success is hard work."



UNIVERSITY OF
CALGARY

...but Have Some Fun Too



“It is the supreme art of the teacher to awaken joy in creative expression and knowledge.”



UNIVERSITY OF
CALGARY

and Maintain Diverse Interests
“A teacher should have a creative mind.”



May Success Be With You!

Thank You!

My teachers

My students

My collaborators

Internet sources for images as cited

ranga@ucalgary.ca

people.ucalgary.ca/~ranga