

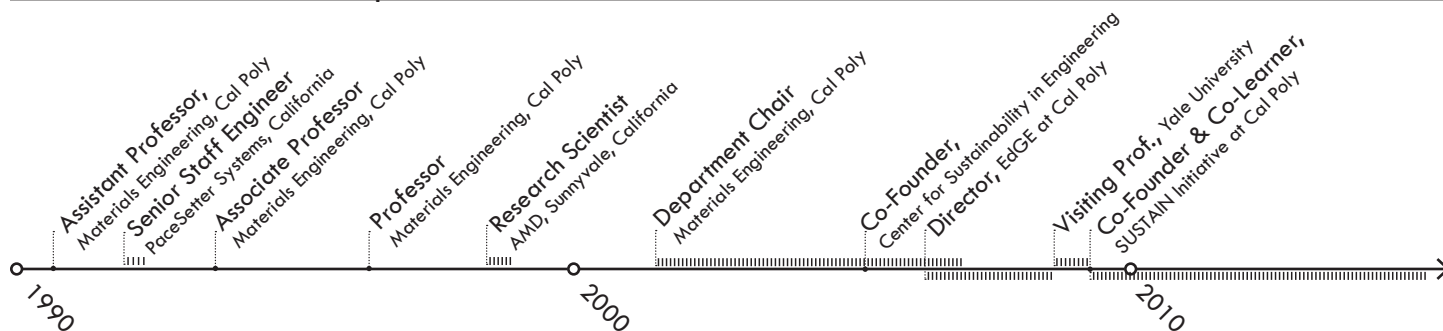


Linda Vanasupa

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2000 Fixlini Street
San Luis Obispo, California 93401
ph: 805.549.9484
cell: 805.235.8473

curriculum vitae : snapshot



education

Stanford University, Stanford, California USA

Ph.D. in Materials Science and Engineering—1991

Thesis: Electrical Activation of Implanted Silicon in GaAs
Advisor: James Plummer

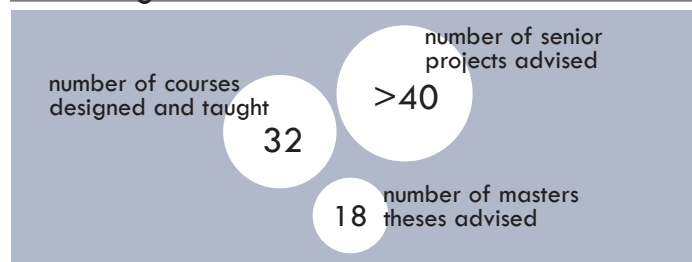
M.S. *summa cum laude*, Materials Science and Engineering—1987

Michigan Technological University, Houghton, Michigan

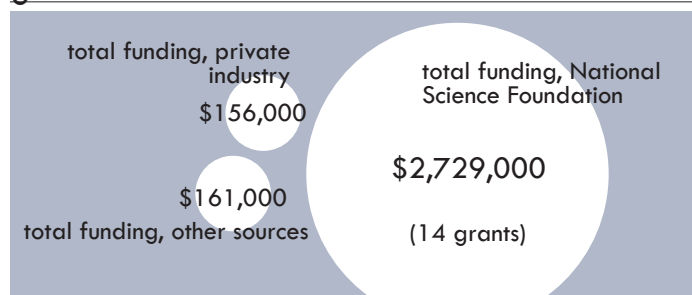
B.S. in Metallurgical Engineering—1985

magna cum laude

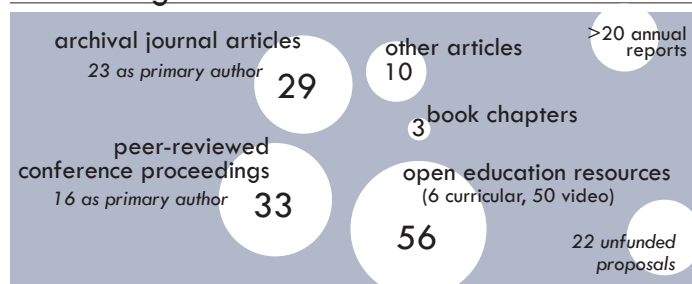
teaching



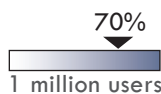
grant activities



authoring



influence indicators



ResearchGate.net | RG Score=20.12 (10•2015)
RG score higher than 70% of RG users on this social network for science

TOP 10 authors
of 8253

Digital Commons Network/Mat. Sci. & Eng.
Ranked 2 of 10 (10•2015)
Over 22,400 full downloads

>156K VIEWS

YouTube Tutorials | over 156K views (10•2015)
24 videos on sustainability concepts
26 videos on materials science concepts



Collaboration
75 unique co-authors representing
20 institutions & >30 academic disciplines

service



American Society for Engineering Education
Materials Division leadership, various roles including program chair (1994-1999)



Materials Research Society
Materials Education Committee, various roles including program chair (1999-2005)

honors

2

University | California Polytechnic State Univ.
President's Service Award with Mat. Eng. Dept. (2008)
Distinguished Teaching Award (2003)

3

College | College of Engineering
Societal Impact (2010); Northrop Grumman Excellence in Applied Research and Teaching (2001); TRW Excellence in Teaching (1993)

1

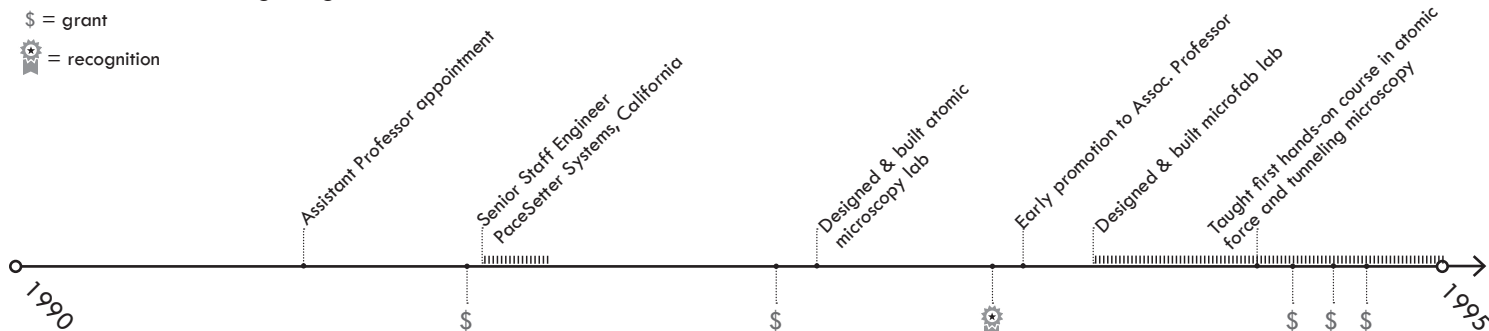
National | Amer. Soc. Engineering Education
Dow Outstanding New Faculty (1997)



Reflections on this period:

I came to Cal Poly because of my desire to learn and serve young peoples' future aspirations. During my first four years, I focused on securing resources needed to modernize Cal Poly's curriculum so that students could learn in labs that were relevant to California's high-tech microelectronics industry.

contribution highlights



teaching highlights

>20
courses

Taught over 20 different courses including freshmen chemistry and freshmen- through masters-level materials engineering courses.

2 new
courses

Created two new courses with laboratories: microelectronics processing and atomic microscopy.

3 new
tools

Brought three new analytical tools into the materials engineering curriculum: Fourier Transform InfraRed microscopy; Atomic Force Microscopy and Scanning Tunneling Microscopy.

microfab



Secured partnerships and resources to design and build a 900 sq. ft. class 1000 cleanroom for undergraduate education



Advised over 15 senior projects.



TRW Excellence in Teaching Award
College of Engineering, California Polytechnic State University

grants activities

FTIR Microscopy in Undergraduate Materials Labs 07/01/91-12/31/93
PI: L. Vanasupa | \$43,000 NSF DUE 9152078

Atomic Force Microscopy Lab: 06/01/92 - 05/31/94
PI: L. Vanasupa | \$50,000 Hughes Aircraft, Santa Barbara Research Center

Microelectronics Processing Lab: 06/01/94 - 05/31/96
PI: L. Vanasupa | \$40,000 Hughes Aircraft, Santa Barbara Research Center

Physical Deposition Mechanisms of Electroless Copper for Multi-level Interconnects: 06/15/94 - 12/31/97
PI: L. Vanasupa | \$170,439 NSF ECCS RUI 9322083

Undergraduate Microelectronics Processing Lab: 07/01/94 - 12/31/97
PI: L. Vanasupa | \$67,756 NSF DUE 945087

publications (peer reviewed unless 📄)

Vanasupa, L.S. (1993). Better Education Tools or Hocus-Pocus?: A Case Study from a Materials Engineering Curriculum, *Proceedings of the American Society for Engineering Education Conference*, Champagne-Urbana, Illinois, 16-19 June (pp. 478-484).

Vanasupa, L.S. (Fall 1992). Bucky Who?! *College of Engineering Update*, California Polytechnic State University, 7. 📄

Vanasupa, L.S. (1992). A 69¢ Look At the Glass Softening Temperature, *Proceedings of the National Educators Workshop: UPDATE 1992*, Oakridge, TN, 11-14 November.

Vanasupa, L.S. (1992). Experiments for an Introductory Course in Materials Science and Engineering, *Proceedings of Synthesis Coalition Community College Engineering Education Conference*, San Luis Obispo, California, 20-22 August.

Vanasupa, L.S. (1992). Review of Critical Reviews in Solid State and Materials Sciences, *Journal of the Minerals, Metals & Materials Society*, 44(12): 52. 📄

Vanasupa, L.S. (1991). Review of Handbook of Semiconductor Silicon Technology, *Journal of the Minerals, Metals & Materials Society*, 43(10):58. 📄

Vanasupa, L. S., Deal, M. D., & Plummer, J. D. (1991). On H Passivation of Si Donors in GaAs Annealed with Plasma-Enhanced Chemical Vapor Deposited Silicon Nitride Caps. *Journal of The Electrochemical Society*, 138(3):870-871.

Vanasupa, L. S., Deal, M. D., & Plummer, J. D. (1991). Modeling activation of implanted Si in GaAs. *Journal of the Electrochemical Society*, 138(7):2134-2140.

Vanasupa, L. S. (1991). *Electrical activation of implanted silicon in Gallium Arsenide*. Ph.D. Thesis, Stanford University.

Vanasupa, L., Deal, M.D., & Plummer, J.D. (1990). A Model for Si Activation in GaAs, *Proceedings of the State-of-the-Art Program on Compound Semiconductors*, Montreal, Ontario, Canada. 11-13 May.

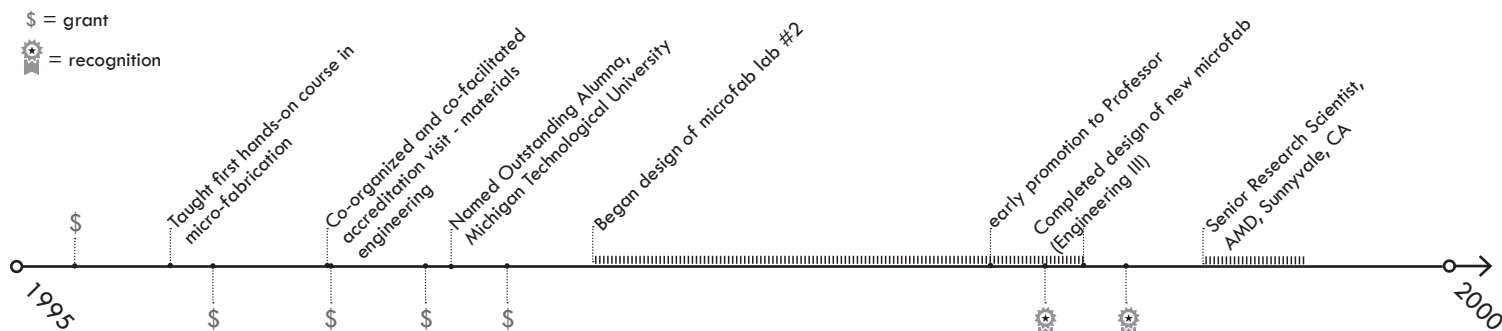
Vanasupa, L. S., Deal, M. D., & Plummer, J. D. (1989). Effects of stress on the electrical activation of implanted Si in GaAs. *Applied physics letters*, 55(3):274-276.

1995-2000

Reflections on this period:

I began to understand the value of collaboration; I partnered with colleagues and students to integrate new technologies into the materials engineering curriculum. Engaging in partnerships beyond my college and institution was a newly-discovered source of professional growth and somewhat unusual at the time.

contribution highlights



teaching highlights

>5
courses

By 2000, taught all but four MATE courses in the 32-course materials engineering curriculum.

4 new
courses

Designed and taught two new graduate courses (x-ray diffraction & thin film processing); Taught an addition technology and society course; Co-developed an interdisciplinary general education history of materials course.

1 new

Served as principal investigator for an equipment grant, qualifying and integrating new x-ray diffraction instrumentation into the materials engineering curriculum.

microfab

Secured additional resources to expand processing equipment and make the first functioning transistors in the MATE microfab, a significant modernization of the MATE engineering capabilities.

Advised over 15 senior projects and six masters theses.

2

Dow Outstanding New Faculty (1997)
 American Society for Engineering Education (ASEE)

Institute for Teaching & Learning Award for Research on College Teaching and Learning (1997). to A. Muscat, E. Allen, E. Green, L. Vanasupa "The Start-Up-company approach to Teaching Semiconductor Processing," San Jose State University

selected publications (peer reviewed unless ©)

Muscat³, A.J., Allen³, E.L., Green³, E.D.H., & Vanasupa, L.S. (1997). The Start-Up company Approach to Teaching Semiconductor Processing, *Proceedings of the American Society for Engineering Education Annual Conference*, 19-22 June.

Vanasupa, L., Pinck¹, D., Joo³, Y.-C., Nogami³, T., Pramanick³, S., Lopatin S.³, & Yang³, K., (1999). The Impact of Linewidth and Line Density on the Texture of Electroplated Cu in Damascene-Fabricated Lines, *Electrochemical and Solid-State Letters*, 2(6):275-277.

Vanasupa, L., Joo³, Y.-C., Besser³, P.R., & Pramanick³, S. (1999). Texture analysis of damascene-fabricated Cu lines by x-ray diffraction and electron backscatter diffraction and its impact on electromigration performance, *Journal of Applied Physics*, 85:2583-2590.

Muscat³, A.J., Allen³, E.L., Green³, E.D.H., & Vanasupa, L. S. (1998). Interdisciplinary Teaching and Learning in a Semiconductor Processing Course, *Journal of Engineering Education*, 87(4), 413-421.

Lent¹, L.E., Vanasupa, L.S., & Tong², P.S. (1998). Whey Protein Edible Film Structures Determined by Atomic Force Microscope. *Journal of Food Science*, 63(5):824-827.

Johnson¹, B., Amster¹, R., & Vanasupa, L. (1998). Grain nucleation and texture analysis of electroless copper deposition on a palladium seed layer. *Journal of Electronic Materials*, 27(7):923-927.

Vanasupa, L. & Braun², D., (1998). The 2-bit Adder, *Proceedings of the National Educators Workshop: UPDATE 1998*, Seattle, Washington.

Vanasupa, L. (1997). An economic lab design for hands-on education in microelectronics processing" *Proceedings of the Frontiers in Education Conference*, Pittsburg, Pennsylvania, 10-12 October.

Centoni¹, S. A., Vanasupa, L. S., & Tong², P. S. (1997). Atomic force microscopy for ultrafiltration membrane imaging. *Scanning*, 19(4):281-285.

Muscat³, E.J., Allen³, E.L. Green³, E.D.H. & Vanasupa, L.S. (1997). An interdisciplinary approach to teaching and learning," *Proceedings of the Frontiers in Education Conference*, 2:653-658. best paper award

Amster¹, R., Johnson¹, B., & Vanasupa, L.S. (1997). Study of nucleation of electroless Cu deposition on Pd" *Proceedings of Electrochemical Synthesis and Modification of Materials Symposium*, P.C. Andricacos, S.G. Corcoran, J.-L. Delplanck, T.P. Moffat, P.S. Searson (Eds), Materials Research Society Fall Meeting, pp. 451-455. Cambridge University Press.

Vanasupa, L.S. (1996). Leveraging the Impact of the ILLI Dollar, *Proceedings of the American Society for Engineering Education Annual Conference*, Washington D.C., 20-23 June.

Jenney¹, C., & Vanasupa, L. (1996). AFM of Biocompatible Polymers. *Microscopy and Analysis*, 47-47.

¹ student collaborator,

² collaborator external to materials engineering,

³ collaborator external to Cal Poly.

grants activities

Electromigration Studies of Electroless Cu on Sub Quarter Micron Test Structures: 09/01/97 - 06/30/99

PI: L. Vanasupa | \$50,267 NSF ECCS 9709447

Electroless Deposition of Copper for Interconnects: 12/31/96-12/31/97

PI: L. Vanasupa | \$10,000 Supplemental to NSF ECCS RUI 9322083

The Morphology of Graphite Samples: 03/01/96 - 02/28/97

PI: L. Vanasupa | \$6,000 Wagstaff, Inc.

Atomic Force Microscopy for the Assessment of Ultrastructure Features & Quality of Dairy Foods & Food Processes: 07/01/95 - 09/30/98

PI: L. Vanasupa; co-PI: P. Tong | \$40,770 CA Dairy Research Foundation

Microelectronics Processing Lab: 06/01/95 - 05/31/96

PI: L. Vanasupa | \$10,000 AMD, Santa Clara, California

2000-2005

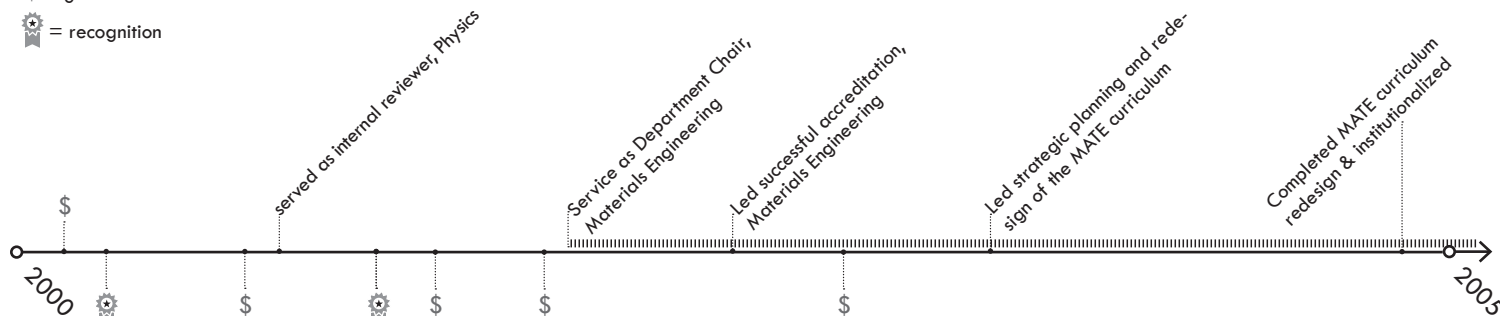
Reflections on this period:

Adopting my daughter transformed my world view and sense of professional responsibility. At international conferences I noticed that engineers and scientists outside the U.S. were fervently applying themselves to the global grand challenges around climate change and social instability. When I looked into the scientific data, I found myself convinced that a responsible engineering education would include the same and sought to bring this to MATE.

contribution highlights

\$ = grant

⚙️ = recognition



teaching highlights



Advised 6 senior projects, 1 masters thesis; New analytic tool (electron backscatter diffraction).

2 ⚙️

Northrop–Grumman Excellence in Teaching and Applied Research Award, College of Engineering, Cal Poly, 2000-01 | Awarded annually among ~175 College of Engineering faculty.

Distinguished Teaching Award, Cal Poly. 2002-03 Up to three awards annually among ~1200 faculty.

leadership and management

Led the materials engineering department (6 faculty, 120 students) through a complete re-invention of itself, including establishing a new vision, mission and strategic initiatives and designing an assessment system focused on direct measures.

Conceived and implemented a departmental web-based marketing strategy that increased the size and quality of the freshman applicant pool from a 55 under-qualified applicants (average merit score of 1892 toward a qualification value of 3600) to more than 88 highly-qualified applicants (average merit score of 3973);

During this half-time appointment as department chair, I continued to teach 4-5 different courses per year, managed and balanced annual department budget of \$1M; Oversaw the recruitment and hiring of 3 of the 6 faculty in the department; Scheduled ~75 course sections annually to serve 1800-2200 students per year; supervised two, half-time staff members.

Revitalized and broadened the department external advisory board to include representatives from a more diverse base (women, design innovation, business and sustainability); advisor participation multiplied by 4.

grants activities

Process Engineering Modules: 01/15/00 - 12/30/02

Pl: L. Vanasupa | \$12,371 NSF sub-Award via San Jose State University

The Foundation Series Modules in Materials Science and Engineering: Integrating Science, Math, and Engineering Technology: 08/01/00 - 06/30/02
Pl: L. Vanasupa, co-Pls: H. Smith, B. London, K.C. Chen, L. Griffin, D.V. Niebuhr | \$75,000 NSF DUE 9952609

Contamination Sources in High-Purity Stainless Steel Tubing: 04/25/01 -12/31/01

Pl: L. Vanasupa | \$3,000 Valex Corporation

Acquisition of Scanning Electron Microscope with Electron Backscatter Diffraction System for Research and Education: 09/01/01 - 08/31/04

Pl: L. Vanasupa; co-Pls: K.C. Chen, L. Moody | \$150,000 NSF DMR 0113559

Analysis and Design of Guitar Saddles: 09/01/03 - 07/30/04

Pl: L. Vanasupa | \$6,064 L.R. Baggs

selected publications (peer reviewed unless Ⓢ)

Vanasupa, L. & Splitt³, F.G. (2004). Curricula For A Sustainable Future: A proposal for integrating environmental concepts into our curricula, *Proceedings Materials Research Society Spring : Symposium BB* (on line at www.mrs.org).

Vanasupa, L. & Chen, K.C. (2004). Materials Science and Engineering in the U.S.: A review of practices and trends, *Journal of Materials Education* 26:127-137. Ⓢ

Vanasupa, L. (2003). *Two Birds with One Stone: How to Integrate Assessment with Education, Best Assessment Processes V*, Terre Haute, Indiana (CD-ROM).

Gleixner³, S., Young³, G., Vanasupa, L., Dessouky³, Y., Allen³, E., & Parent³, D. (2002). Teaching Design of Experiments and Statistical Analysis of Data Through Laboratory Experiments, *Proceedings of Frontiers in Education*, Boston, Massachusetts, 7-9 November.

Cecchi¹, M., Braun², D., Smith², H. & Vanasupa, L. (2002). Statistical method to optimize the efficiency of multi-layer polymer LEDs, *Electronic, Optical and Optoelectronic Polymers and Oligomers Symposium Proceedings*, MRS Publishing, pp. 93-98.

Vanasupa, L., Smith², H. (2002). The Fundamentals of Variation: An Inexpensive and Elegant Experiment for Engineering Students, *Proceedings of the New Educators Workshop: UPDATE 2002* (CD-ROM).

Chen, K.C., Vanasupa, L., Orling, T. (2002). A Multi-Functional Introductory Materials Science Courses: Emphasizing Engineering And Achieving Accreditation Objectives, *Proceedings of the Materials Research Society*, 22-24 November, Boston, Massachusetts.

Allen³, E., Gleixner³, S., Young³, G., Parent³, D., Dessouky³ Y., & Vanasupa, L. (2002). Microelectronics Process Engineering at San Jose State University: A Manufacturing-Oriented Interdisciplinary Degree Program, *International Journal of Engineering Education*, 18:519-525.

Vanasupa, L., Smith², H., Gleixner³, S., Young³, G., Allen³, E., (2001). Dealing with Variation in Measurements, *Proceedings of the Materials Research Society Spring Meeting: Symposium GG*, San Francisco, California.

Vanasupa, L., London, B., Smith², H., Chen, K.C., Jones³, J., Niebuhr, D., Griffin, L. (2001). The Foundation Series on Corrosion: Integrating Science, Math, Engineering & Technology in a Lab Setting, *Proceedings of the American Society for Engineering Education Annual Conference* (CD-ROM).

Braun², D., Kingsbury², K. & Vanasupa, L. "(2000). A Multidisciplinary Polymer Electronics Laboratory," *Proceedings of Frontiers in Education*, 18-21 October, Kansas, Missouri.

¹ student collaborator, ² collaborator external to materials engineering,

³ collaborator external to Cal Poly.

advisee works

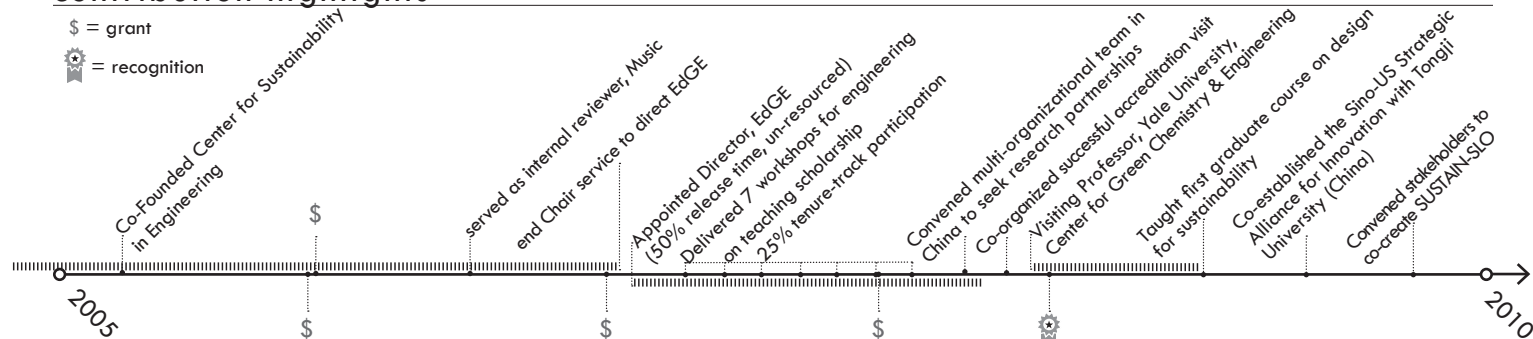
Cecchi, Michele Mario (2001). *Experimental design and analysis of polymer based light emitting diodes using statistical methods*. Engineering Masters thesis, California Polytechnic State University, San Luis Obispo, CA.

2005-2010

Reflections on this period:

This was a time of prolific innovation in which I worked with many different collaborators to bring forth experiments—successes and failures. I learned about the unintended consequences of change in human systems. I also realized that the kind of transformational results I sought required new partnerships which I formed during my sabbatical time at Yale University.

contribution highlights



teaching highlights

new curriculum

Integrated systems thinking, project-based learning, and sustainability concepts into courses; co-implemented new MATE curriculum.



Advised 1 senior project, 6 masters thesis.



California Polytechnic State University (2008)
 Awarded to all six faculty of the materials engineering department for outstanding service to the community. One award is given per year.

leadership and management

Led the materials engineering programs' comprehensive redesign of the materials engineering curriculum to include design, project-based learning and sustainability issues;

Brought materials engineering program into national visibility as a Research Affiliate of the National Academy of Engineering's Center for the Advancement of Scholarship in Engineering Education. Department was twice featured among the 27 CASEE Research Affiliates in the center's annual publication (CASEE Chronicles Vol. III (2006) & IV (2007));

Created a College of Engineering initiative on Educating Global Engineers (EdGE), an effort to create shared commitments between engineering programs around global awareness as a core responsibility of the engineering education; this resulted in a new College of Engineering vision of serving society through innovation in engineering education.

Co-founded the Center for Sustainability in Engineering. Hosted seven campus-wide forums from 2005-2007 with nationally renowned speakers on sustainability;

grants activities

Triple Bottom Line Awareness in Design : Diversifying the Engineering Profession of the 21st Century: 9/01/2005-9/1/2009
 PI: L. Vanasupa; Co-PIs: K. Chen, R. Savage, B. London | \$1,004,982 | NSF EEC 0530760

Recyclability Index for Automobiles: 09/01/05 - 08/31/06
 PI: Y. M. Nelson; co-PIs: H. Cota, A. Kean, M. McDonald, D. Richards, L. Vanasupa | \$9,990-U.S. Environmental Protection Agency

Collaborative Research: Civil and Environmental Engineering Education Transformational Change: Sustainability Curriculum Development, Implementation, Dissemination and Assessment: 10/01/07 - 09/30/11
 PI: L. Vanasupa | \$91,520 -NSF DUE 0717428

Educating Engineering Innovators: Planning Visit for Finalizing Collaborative Research in China: 12/01/2007-12/1/2008
 PI: L. Vanasupa; Co-PIs: K. Lancaster, M. McDonald, A. Morris | \$25,278 NSF OISE 0753147

selected publications (peer reviewed unless ©)

Vanasupa, L., Stolk, J. & Herter, R. (2009). The Four-Domain Development Diagram: A guide for holistic design of effective learning experiences for the 21st century engineer, *Journal of Engineering Education*, 98(1):68-81.

Vanasupa, L., Harding, T., & Herter, R. (2009). Transforming the culture, delivery and content of an undergraduate engineering program: process, pitfalls, and potential for lasting change. *Proceedings of Research in Engineering Education Symposium*. http://rees2009.pbworks.com/f/rees2009_submission_7.pdf

Widmann, J. & Vanasupa, L. (2008). Work in Progress: Attaining and Measuring Global Competency for Engineering Graduates, *Proceedings of Frontiers in Education*, Saratoga Springs, New York, 22-25 October.

Vanasupa, L., Rogers, E. & Chen, K.C. (2008). Work in Progress: How Do We Teach and Measure Systems Thinking, *Proceedings of Frontiers in Education*, Saratoga Springs, New York, 22-25 October.

Vanasupa, L., Chen, K.C., Breitenbach, S. & Bangs, K.R. (2008). Work in Progress: The Four Domain Development Diagram as a Design Guide to Retain Female (and Male) Students, *Proceedings of Frontiers in Education*, Saratoga Springs, New York, 22-25 October.

Vanasupa, L., & Granados, V. (2008). A Need for Systems-Oriented Outreach: Lessons from a failed, 1-dimensional approach, *Proceedings of the American Society for Engineering Education Annual Conference*, 22-26 June.

Vanasupa, L., Chen, K.C., Stolk, J., Savage, R., Harding, T., London, B. & Hughes, W., (2008). Converting traditional materials labs to project-based learning experiences: Aiding students' development of higher-order cognitive skills, *Journal of Materials Education*, 30(5-6):281-286.

Vanasupa, L., Stolk, J., Harding, T. & Savage, R. (2007). A Systemic Model of Development: Strategically Enhancing Students' Cognitive, Psychomotor, Affective and Social Development, *Proceedings of Research in Engineering Education*, Honolulu, Hawaii, 22-24 June.

Harding, T., Vanasupa, L., Savage, R. & Stolk, J. (2007). Work-in-Progress - Self-Directed Learning and Motivation in a Project-based Learning Environment, *Proceedings of Frontiers in Education*, Milwaukee, Wisconsin, 10-13 October.

Savage, R., Chen, K.C. & Vanasupa, L. Integrating Project-based Learning Throughout the Undergraduate Engineering Curriculum, *Journal of STEM Education*, 8:1-13.

Vanasupa, L., Slivovsky L. & Chen, K.C. (2006). Global challenges as inspiration: A classroom strategy to foster social responsibility, *Science and Engineering Ethics*, 12:373-380.

Vanasupa, L. (2006). The future of materials undergraduate programs: Can we avoid extinction?, *Journal of Materials Education*, 28(1-2):105-112.

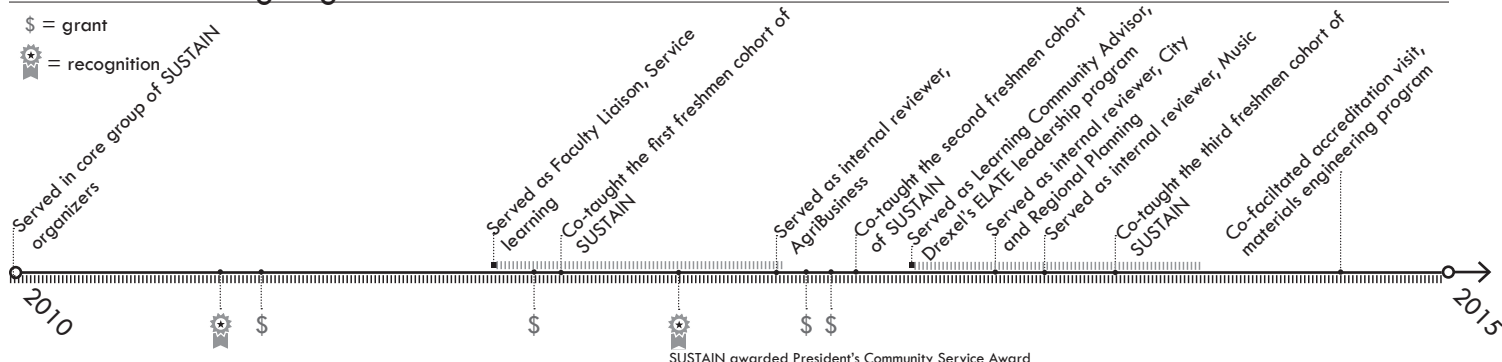
Vanasupa, L., Chen K.C. & Splitt, F.G. Classroom Techniques to Promote Engineering Solutions for a Sustainable Future, invited presentation at the International Union of Materials Research Societies, Singapore, July 3-5, (2005), published in *Journal of Materials Education* 28(3-6):171-178.

2010-2015

Reflections on this period:

By removing many of the artificial boundaries in the learning process, I discovered that systemic transformation begins with me, since I was a participant in the system. I abandoned the heroic leader model and focused on self-transformation to prepare for authentic collaboration. A challenging result of this process was the transition from imagined "expert" to genuine "co-learner."

contribution highlights



teaching highlights



Advised 12 senior projects, 5 masters thesis.



First recipient of the Societal Impact Award, College of Engineering, Cal Poly, 2010.

selected advisee works at Cal Poly

Kaylor, Sean (2009). Development of a Low Cost Handheld Microfluidic Phosphate Colorimeter for Water Quality Analysis, Engineering masters thesis.

Kevin Ka-Wan Ng (2010). Time-temperature Curing Relationship of an Adhesive Binder with Rice Straw. Engineering masters thesis.

Jorgensen, Eric (2011). Using Living Materials to Intervene in the Natural Succession Process to Accelerate the Re-Development of a Self-Sustaining Ecosystem that has been Damaged by Human Intervention, Senior project.

Hyland, Patrick J. (2011). Effect of Au Content on Microstructural Evolution of SnAgCu Solder Joints that Undergo Isothermal Aging and Reliability Testing, Engineering masters thesis.

Hahn, Eric (2012). Determining an inorganic mineralization process to inhibit organic degradation and preserve the dimensional stability of bamboo. Senior project.

Herbert, Leah, Hosek, Ian, & Kripalani, Rishi (2012). The characterization and comparison of biochar produced from a decentralized reactor using forced air and natural draft pyrolysis. Senior project.

Riley, Chris (2012). The Mitigation of Eutrophication Using Microporous Polymer Membranes to Control Algae Growth. Senior project.

Dunn, Chris (2013). Analyzing the Acoustical Properties of Alternative Materials in Guitar Soundboards to Reduce Deforestation. Senior project.

Liu, Nicholas (2013). Fabrication and Characterization of a Palladium/Porous Silicon Layer. Engineering masters thesis.

Gonzales, Hilda (2014). Material Composition and Toxicology of Cosmetic Products. Senior project.

grants activities

Establishing a Distributed Community of Educators To study a transformational education experiment: 9/01/2010-9/01/1/2015

PI: L. Vanasupa, co-PI: L. Schlemer | \$464,110 NSF EEC 1025265

Creating a replicable transformation path for change: A pilot study on overcoming the barriers to individualized teaching and learning: 9/15/2011-2015

PI: L. Schlemer, co-PI: L. Vanasupa | \$294,496 NSF DUE 1044430

WIDER: EAGER - Catalyzing Wide Scale Innovation: Creating the Conditions for Viral Transformation: 9/15/2012-9/15/2014

PI: L. Vanasupa, co-PI: L. Schlemer | \$294,241 NSF DUE 1256265

A community that learns by doing: 9/21/2012-7/1/2013

PI: L. Vanasupa | \$45,000 SCU Service Learning, \$10,000 So-Cal Gas

selected publications (peer reviewed unless ©)

Vanasupa, L. (2014) Relational versus transactional community engagement: An experience of the benefits and costs. *Proceedings of the ASEE Annual Conference*, Indianapolis, Indiana, 15-18 June.

Pawley, A., Hoffmann, S.R., Cardella, M.E., Ohland, M.W., Rao, R.L., Jahiel, A.R. Seager, T. & Vanasupa, L. (2014). Assessing Sustainability Knowledge: A Framework of Concepts. *Proceedings of the ASEE Annual Conference*, Indianapolis, Indiana, 15-18 June.

Vanasupa, L., Schlemer, L., Burton, R., Brogno, C., Hendrix, G., & MacDougall, N. (2014). Laying the Foundation for Transdisciplinary Faculty Collaborations: Actions for a Sustainable Future. *Sustainability*, 6(5), 2893-2928.

Burton, R., Schlemer, L., & Vanasupa, L. (2012). Transformational Innovation: Reflections on How to Foster it in Engineering Education Systems. *International Journal of Engineering Education*, 28(2): 275-285.

Vanasupa, L., McCormick, K. E., Stefanco, C. J., Herter, R. J., & McDonald, M. (2012). Challenges in Transdisciplinary, Integrated Projects: Reflections on the Case of Faculty Members' Failure to Collaborate. *Innovative Higher Education*, 37(3):171-184.

Vanasupa, L., Zhang, Q., & Mihelcic, J. R. (2011) Assessing Engineering Students' Readiness To Collaborate for Sustainable Design: An Open Access Instrument For Experimentation. *Proceedings of the ASEE Annual Conference*, Vancouver, British Columbia, 26-29 June.

Vanasupa, L. (2011). The Human Dimension of Systemic Department-Level Change: A Change Agent's Retrospective on a Case of Reform. *Advances in Engineering Education*, 2(4): http://advances.asee.org/?page_id=208

Vanasupa, L., Stolk, J., & Harding, T. (2010). Application of self-determination and self-regulation theories to course design: Planting the seeds for adaptive expertise. *International Journal of Engineering Education*, 26(4):914.

Vanasupa, L., Burton, R., Stolk, J., Zimmerman, J. B., Leifer, L. J., & Anastas, P. T. (2010). The Systemic Correlation Between Mental Models and Sustainable Design: Implications for Engineering Educators. *International Journal of Engineering Education*, 26(2):438-450.

institutional entrepreneurship

Convened groups of stakeholders from the university and community around shared commitments. This group of over 30 people co-created what became the SUSTAIN-San Luis Obispo learning initiative. From 2010-2015, this self-organized learning community engaged a variety of partners (over 16 faculty, over 200 freshmen of 49 majors, over 30 community organizations) who were committed to exploring together new models of collaborative, project-based learning in 42 community projects.

I conceived of SUSTAIN during attempts to partner with researchers in China around sustainability. However, what SUSTAIN became was what the many people brought to it, to include my core collaborators, Roger Burton and Elizabeth Schlemer.

2015-2020

Reflections on this period:

In this era, I can see the gap between our scientific models of how the world works and “reality.” This means that most of what is taught is for a world that doesn’t exist. What does education for a complex, dynamic, emergent system look like? How can we prepare people for actual world in which they will live?

contribution highlights



National Science Foundation service

NSF invites the national engineering research community to submit ideas representing the frontiers of engineering innovation; selected ideas are invited to NSF to shape a \$16-22 M open call for proposals. An idea that I authored, in close collaboration with R. Burton and L. Schlemer, was 1 of 7 invited amongst the 300 submissions; this was a career highlight for me, since it was a recognition of the importance of our work. (I have served on over 10 research review panels for NSF.)

selected advisee works at Cal Poly

Quiazon, Ralph (2006). Increasing the performance of a PEMFC through changes in the bus plates. Senior project.

Palmero, Jennifer (2006). Development of durable coatings for a high pressure hydrogen PEM electrolyzer. Engineering masters thesis.

Crane, Jeffrey (2007). Characterization of sucrose based dip deposited pyrolytic carbon thin films on 316L stainless steel foil for bipolar plate application. Engineering masters thesis.

Munroe, Rick (2007). Design of a three inch magnetron cathode for a batch sputtering tool. Engineering masters thesis.

Wakefield, Orin (2007). Over potential in situ testing of titanium nitride coated polymer exchange membrane electrolyzer electrodes Engineering masters thesis.

Jorgensen, Eric (2011). Using Living Materials to Intervene in the Natural Succession Process to Accelerate the Re-Development of a Self-Sustaining Ecosystem that has been Damaged by Human Intervention, Senior project.

Bevier, Johnathan (2009). Design and development of rapid battery exchange systems for electric vehicles to be used as efficient student transportation, Engineering masters thesis.

Plangrskul, Nithi & Dorsano, Nicholas (2011). Materials Characterization of Bamboo and Analysis of Bonding Strength and Internal Strength as a Structural Member in Reinforced Concrete, Senior project.

Cooke, Shelley & Surette, Sarina (2011). Migration Models - Comparison of PVC, PET and PLA Diffusivity, Combined with a Production Cost Model for Westridge Laboratories. Senior project.

Johnson, Casey, & Klonowski, Charlie (2012). Effects of Abrasive Particles on the Projected Fatigue Life of Nylon Climbing Rope Senior project.

Beemiller, Griffin (2012). Residential Water System Circuit Breaker for Monitoring of Abnormal Use. Senior project.

Esposito, Nicole (2013). Soil Nutrient Availability Properties of Biochar. Engineering masters thesis.

Cook, Caitlyn (2015). Minimizing Sheet Resistance of Organic Photovoltaic Cell Top Contact Electrode Layer: Silver Nanowire Concentration vs. Conductive Polymer Doping Concentration, Senior Project.

additional publications (peer reviewed unless ©)

Zhang^{2,3}, Q., Vanasupa, L., Mihelcic^{2,3}, J. R., Zimmerman^{2,3}, J. B., & Platukyte^{2,3}, S. (2012). Challenges for integration of sustainability into engineering education. In American Society for Engineering Education. American Society for Engineering Education. best paper award

Vanasupa, L., Stefanco^{2,3}, C., McCormick², K., & Herter², R. (2008). Potential challenges for engineering students working on teams with liberal arts students: Recommendations for structuring and managing multidisciplinary projects. Paper presented at the Research in Engineering Education Symposium, Davos, Switzerland.

Chen, K., Vanasupa, L., Harding, T., London, B., & Savage, R. (2010). Embracing Sustainability in the Materials Engineering Curriculum: Suggestions and Examples to Build Competencies for Today's Materials Engineering Graduate. Minerals, Metals and Materials Society/AIME, 420 Commonwealth Dr., P. O. Box 430 Warrendale PA 15086 USA.[np]. 14-18 Feb.

Vanasupa, L., London, B. & Smith², H. (1998). The Foundation Series: Integrating Math, Science and Technology into an Introductory Materials Laboratory Course, presented at The Minerals, Metals and Materials Society Annual Meeting, San Antonio, TX; February 1998.

London, B. & Vanasupa, "The Role of the Laboratory in Materials Education," presented at the Materials Research Society Fall Meeting, Boston, MA; November 29, 1998.

London, B., Vanasupa, L., Allen³, E. & Demetry³, C. "Materials Science or Materials Engineering: How Best to Prepare Undergraduates?" presented at the Materials Research Society Fall Meeting, Boston, MA; November 29, 1998.

London, B, Vanasupa, L. & Allen³, E "MSE Undergraduate Education" presented at the Gordon Research Conference on Materials Science and Engineering, July 1998.

Vanasupa, L. & London, B., "The Way Things Work: A Technical Course for Non-technical Majors," presented at the American Society for Engineering Education Pacific South West Section Conference, March 1997.

Tong, P.S., Fairchild¹, A.C. & Vanasupa, L.S. (1996) Use of atomic force microscopy for the characterization of membranes before and after milk ultrafiltration, Annual Meeting, American Dairy Association, Corvallis, Oregon, July.

Allen³, E.A., Green^{2,3}, E.D.H. & Vanasupa, L.S. "Cooking Without Recipes: a Case Study for an Open-Ended Laboratory Experience in Semiconductor Processing," Proc. American Society for Engineering Education Annual Conference, Washington D.C. (June 1996).

¹ student collaborator, ² collaborator external to materials engineering,

³ collaborator external to Cal Poly.

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