



Professional Profile

Focusing on developing fun, interactive experiences by bridging the analogue of the physical world with mediascapes in Human Computer Interaction. Twenty years of combined professional experiences in the arts and education have refined my expertise as a learning scientist who can conceptualize, design, develop and produce engaging content, backed by data, with a commitment to making collaboration, learning and creativity accessible, inclusive and productive.

www.michaelswart.com

Design, Research, Teaching & Project Management:

The University of Wisconsin - Madison (Madison, WI)

Jul. 2017 - Current

Associate Researcher, Department of Educational Psychology

- Post-Doctoral Associate Researcher for Mitchell Nathan, Ph.D., Professor of Learning Sciences & Educational Psychology
 - ◆ Co-Designer of *The Hidden Village*, a 3D motion capture game for learning geometry
 - ◆ Co-Designer of research projects working with High School Students in Dane County, WI
 - ◆ Project Manager for *The Hidden Village*, including: IRB compliance, MMSD District Liaison, Principal and Teacher Liaison, Participant Recruitment, Scheduling, Testing
 - ◆ Data Design, Collection, Analysis and Management
 - ◆ Designing Assessment in Qualtrics and Managing Data Collection
 - ◆ Big Data Analysis (Participant, Action, Event, Sequence) of Game Data using R, Rapid Minor, SPSS, Excel

Assistant Director, James S. McDonnell Foundation (JSMF) "Teachers as Learners" Program

- Domain Expert and Assistant to Director, Professor Mitchell Nathan, Ph.D.
 - ◆ Review and Assessment of Research Grant Proposals totaling \$40M program for 16 Interdisciplinary Teams Nationwide, each with \$2.5M budget to integrate findings from the cognitive and affective sciences into Teacher Education, Teacher Prep, Professional Development, Coaching and Certification Programs
 - ◆ Advisory Panel Member, Co-Organizer for Annual Meetings
 - ◆ Representative of JSMF to funding collective of NGO's (Foundations including Gates, Carnegie, Spenser, Joyce, Walton, McKnight, MSDF, etc.) looking to contribute monies to re-designing Teaching & Instruction by integrating research from the Learning Sciences and New Technologies

MathShifu, Inc. (San Diego, CA)

Jan. 2017 - Jun. 2017

Director, Game Design & Development

- Curriculum & Content Expert
 - ◆ Drafting Curriculum in accordance with learning objective as well as Common Core Standards
 - ◆ Integrating mathematical content (fractions and algebraic thinking) into a game with a focus on game-play.
- Co-Designer
 - ◆ Concepting the ludology of the game, including narrative arc, player goals, leveling, UX and UI
 - ◆ Designing wireframes for rapid prototyping and support documents for the Art & Programming Departments
- Co-Producer
 - ◆ Reviewing business plan, budgets, schedules, Scope of work, deliverables
- Researcher for Play-Testing
 - ◆ Designing qualitative and quantitative efficacy evaluations of game play Alpha & Beta Delivery
 - ◆ Evaluating educational value by designing and conducting quantitative randomized pre/post experiments.

Teachers College, Columbia University (New York, NY)

Sep. 2009 - Nov 2016

NSF Doctoral Research Fellow

- Lead Researcher of the Mobile Mathematics Movement (M3) partnership w/ WNET-13 via NSF Cyberlearning Exploratory Grant - \$550K (Co-Author)
 - ◆ Designed & Developed M3, a digital-tablet tutor-game for learning mathematical fractions using physical gestures and narratives from PBS Emmy Award Winning *Cyberchase*.

- ◆ Drafting white papers: Designing pedagogy for elementary math curriculum (re: Common Core standards); Storyboarding; Wireframing; Asset design; Alpha/Beta Testing; Publishing
- ◆ Co-managed budgets and contracts (with the Office of Grants and Partnerships)
- ◆ Drafting RFPs for development firms; Reviewing proposals; Co-Managing 3rd-party vendor and SOW.
- ◆ Designing on-site randomized controlled experiments in NYC After School Programs
- ◆ Designed and Developed Measurements and Assessments
- ◆ Partnered with NYC After School Programs (Drafting IRBs, Enrolling Public School sites, Pitching Principals and Afterschool Programs, Recruiting participants, Consenting/debriefing parents, and Scheduling 7 schools, 333 students for classroom instruction and game-play: PS 154 Harriet Tubman School, PS 20 Anna Silver School, PS 110 Florence Nightingale School, PS 134 Henrietta Szold, Henry Street Settlement, PS 36 Margaret Douglas School, PS 161 Pedro Albizu Campos).
- ◆ Conducted semi-structured clinical interviews; Coded and Analyzed video logs, transcripts and free-response data
- ◆ Analyzed data using EDM (Educational Data Mining) feature engineering; Hierarchical Linear Regressions; EFA
- ◆ Lead all classrooms in game-play and fun!

Research Associate, Institute for Learning Technologies

- Completed 3 research projects:
 - ◆ Rhythmatics (using online synthesizers to make rhythms and learn fractions);
 - ◆ Geometric Paths (quest computer game navigating robots around obstacles using geometric properties);
 - ◆ Fishing Lines (teaching proportionality by navigating the fisherman's boat to the fish along the number line).

Adjunct Professor, Department of Mathematics, Science & Technology

- MSTU 4133: Cognition and Computers - A graduate level class designed to explore the field of Cognitive Science and the metaphor of the brain as a computer.
 - ◆ The course critiqued research on human perceptual systems, drawing parallels between stimulus and input, neuroanatomy and hardware, organization and files, memory and storage, strategy and retrieval, learning and optimization. The course culminated by highlighting research on new technologies in education and leading theories for effective instruction.

Course Assistant & Instructor, Department of Human Development

- Graded Papers, and monitored online participation for HUDN 4029: Cognition & Learning w/ Prof. Barbara Tversky
- Designed and Instructed 2 Sessions on (1) Cognitive Neuroscience and (2) Symbols.

Graduate Assistantships, Department of Human Development

- Writer /Editor for HUDN Magazine, including: Feature Articles, Staff Profiles, Research Reviews, etc.
- Creative Director for HUDN Magazine, including: Photography, illustration, designer/pagination and graphic arts.

Tiny Tots Sports (San Diego & Los Angeles, CA)

Sep. 2004 - June 2005

Montessori Physical Education Instructor

- Co-Developed and instructed children on a progressive curriculum incorporating elements of balance, agility, movement, and perspective (through sports) to explore handedness, hemispherical dominance and development.

Film Production, Photography, Graphic Arts and UX Design:

AMT (Los Angeles, CA; New York, NY)

June 2003 - Sep. 2012

Director, Art Director, Freelance Artist, Production Coordinator, Key Production Assistant

NEW YORK

- Created, developed, produced design materials and technologies for Michael Flutie's Office (MFO), JEC Reunion and iGeneration;
- Production and Stage management for non-profits Urban Zen, Agent of Change

LOS ANGELES

- Created, developed, coordinated and produced films, television, commercials and music videos

Films (Digital):

Big Brother Does Good (Dir,Shoot,Ed.)

The DooHood Games (Dir., Shoot,Ed.)

Doogood Hooliday Season (Dir., Shoot)

The Hunting of the President (Shooter)

Commercials/ Music Videos:

2nd AD - Easter Seals - "Angels" w/ Marlee Matlin,
Wal-Mart - "Summer", Vega4 - "Life is beautiful",
Asst. Coord. - Titleist w/ John Cleese,
Nutrigrain - "Horse"

Key Prod. Asst. - Nelly Furtado - "Say It Right", Ludacris
feat. Mary J. Blige - "Runaway Love", RHCP - "Desecration
Smile", GoDaddy - "Superbowl", Chili's - "Pepper", Verizon
- "Roadtrip", Cadillac - "Fuqua"

Sesame Workshop (New York, NY)

July 2008 - Dec. 2008

Digital Media Intern

- Curated clips from archives and edited segments for mobile user content.
- Designed digital assets for international mobile users.
- Consulted on pedagogical approaches to new projects.

The Doogood Conservatory (San Diego, CA)

April 2003 - Dec. 2007

Vice President of Communications

- Instructed children at our fundraisers in language arts and studio art crafts for community outreach.
- Managed media relations for non-profit youth organization for over 30 programs located nationwide and 3 international programs.
- Designed collateral materials, constructed and maintain organization's website/multimedia materials.

St. Jude Children's Research Hospital (National Offices: TN, CA, NY)

August 1999 - July 2017

Public Speaker & Fundraiser, Major Gifts Department

- Spoke as representative of the hospital to crowds ranging from ~25 to 2500 persons in a wide range of forums (college auditoriums, sporting events, boards of directors, community leaders, etc.) to raise millions of dollars amongst major donors
- Designed, created, and produced collaterals and fundraising proposals for ALSAC, the charitable fundraising arm of St. Jude.

Vivendi Universal (San Diego, CA)

July 2002 - April 2003

Graphic Artist/UX Designer

- Designed, created and produced websites and advertising campaigns for corporate holdings, major label artists including:

Websites:

Rollingstone.com
EMusic.com
MP3.com
MP4.com

Ad Campaigns:

Artists: U2: Beautiful Day, Alanis
Morrisette Nappy Roots, 50
Cent, Madonna: Die Another
Day, Foo Fighters, Sean Paul,
CKY, Coldplay, N.O.R.E., Steve
Earle

Multi-Media:

Cody Chestnut Tour,
SXSW CD Sampler,
Must Have Music,
Nashville Star,
EMusic Feature Pages,
Listening Party,
MP3.com "New Track Attack"

Hill | Holliday (Boston, MA)

May 2001 - Aug. 2001

Externship: Digital Archivist/Junior Creative

- Developed Creative Pitch for *Marshall's Department Store*
- Illustrated all storyboards for broadcast and print campaign
- Created Digital archive of Agency Clippings Database

Target Department Stores (Minneapolis, MN)

June 2000

Writer/Illustrator

- Wrote and illustrated children's coloring book sponsored by Target.

St. Jude Children's Research Hospital (Memphis, TN)

Sep. 1999 - June 2000

Graphic Artist

- Designed, created, and produced collaterals and fundraising proposals on behalf of ALSAC for clients that included: Ranger Boats, Keebler Foods, Nimitz Oil, Coors Brewing, Convention 2000, SASCO, Walgreens, National Auctioneers Association, Country Cares Radiothon.
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Musician

Drums & Percussion (San Diego & Los Angeles, CA; New York, NY)

June 2003 - June 2016

- Ferrari Truck, Ferrari Truck (Behaving like Animals EP; 2016); Live at Arlene's Grocery (2013)
 - Mary Magdalen, DEMO EP (2004)
 - The Buzzkill Romantics, Self-Titled LP (2003)
 - The Bad Apples, Self-Titled LP (2002)
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Educational History

Columbia University Teachers College (New York, NY)

Ph.D. Cognitive Science in Education; MPhil Master of Philosophy	2016
Ed.M. Educational Psychology: Cognitive/Behavioral/Developmental Analysis	2015
M.A. Cognitive Science in Education	2011

The University of Virginia (Charlottesville, VA)

B.A. Psychology w/ Distinction	2001
B.A. Cognitive Science w/ Distinction	2001
Minor: Studio Art	2001

Skills

- Admin: Microsoft Word, Excel, Access, and PowerPoint; Google Apps & Drive, Workflow Platforms (e.g., Atlassian), Qualtrics
- Design: Final Cut Pro (Non-Linear Editors), Adobe CS incl. Photoshop, Illustrator, In Design, Flash, InVision
- Statistical: R, SPSS, Rapid Miner, EEG, fMRI, Eye-Tracking
- Programming: HTML, Pascal, CSS, Matlab, UNITY 3D
- Photography: Film/Digital SLR; Video 24p/30p/HD



Academic Curriculum Vitae

Teachers College Columbia University, New York, NY

3.90 G.P.A.

Coursework:

Cognitive Sciences: Spatial Thinking, Visual Explanations, Psychology of Language and Reading, Psychology of Media, Cognition and Learning, Cognitive Development, Cognition and Computers, Educational Psychology, Adv. Seminar on Motivation, Doctoral ProSeminar, Adv. Seminar in Cognitive Development, Development of Creativity, Adv. Seminar: Case Studies in Creativity, Adv. Seminar: Critical Review of Current Topics in Educational Psychology, Development in Atypical Contexts; Eye-Tracking Training

Neuroscience: Brain and Behavior I & II, Adv. Seminar on Neuroplasticity, Neuroimaging: EEG, Neuroimaging: fMRI, Current Topics in Neuroscience and Education

Statistics: Probability and Statistical Inferences, Applied Regression Analysis, Linear Models in Experimental Design, Multivariate Analysis I, Core Methods in Educational Data Mining (Audit), Feature Engineering (Audit)

Research: Psychological Measurement, Research Methods in Social Psychology, Research Practicum in Educational Psychology, Cognition, and Learning, Research Practicum in Educational Media, Research Practicum in Semiotics, Graphical Depiction and Gestural Communication, Research Practicum for *Mathemantics*

Journal Publications

Vitale, J.M., Black, J.B., and **Swart, M.I.** (2013). Applying Grounded Coordination Challenges to Concrete Learning Materials: A Study of Number Line Estimation. *Journal of Educational Psychology*, 105(4).

Vitale, J.M., **Swart, M.I.**, Black, J.B. (2014). Integrating intuitive and novel grounded concepts in a dynamic geometry learning environment. *Computers & Instruction*, 72, 231-248.

Nathan, M. J. & **Swart, M.I.** (under review). Materialistic epistemology lends design wings: Learning environment design as an embodied process. *Educational Technology Research and Development*. Special Issue on Embodied Cognition and Technology for Learning, (T.J. Kopcha, Ed.)

Nathan, M. J., Schenck, K., Vinsonhaler, R., Michaelis, J., **Swart, M.I.** & Walkington, C. (under review). Embodied geometric reasoning: Dynamic gestures during intuition, insight, and proof. *Journal of Educational Psychology*.

Swart, M.I., Yang, J., Lowes, S. (in Prep). Creating a tool for assessing motivation, interest, self-efficacy and learning.

Swart, M.I., Vitale, J.V., Black, J.B. (in Prep). Causality in design-based research on games in education through randomized experiments. *Journal of the Learning Sciences*.

Swart, M.I., Vitale, J.V., Black, J.B. (in Prep). Design lessons for digital tablet-based interventions for learning mathematical fractions. *Journal of Educational Psychology*.

Conference Papers, Presentations & Posters:

Harris, R., Fadjo, C., Carson, E., Hallman, G., **Swart, M.I.** (2009): Creativity in video game design as pedagogy. SIGGRAPH Talks

Vitale, J. M., Black, J. B., & **Swart, M.I.**, (2011). Promoting development of geometry concepts: Interfacing multiple embodied representations with a computer game. Proceedings of the 33rd Annual Conference of the Cognitive Science Society. Austin, TX: Cognitive Science Society.

Swart, M.I. (2013). M3: Utilizing Gestural Conceptualizations of Mathematical Fractions on Mobile Devices. Teachers College Academic Festival. New York, NY.

Swart, M.I., Friedman, B., Vitale, J.M., Kornkasem, S. and Black, J.B.B. (2014). Mobile Movement Mathematics: Designing a digital tablet tutor for FrActions. NYC Subway Summit on Cognition and Learning. New York, NY.

Swart, M.I., Friedman, B., Vitale, J.M., Kornkasem, S., Hollenberg, S., Lowes, S., Nankin, F., Sheppard, S. and Black, J.B.B. (2014). Mobile Movement Mathematics: Exploring the gestures students make while explaining FrActions. 2014 Annual Meeting of the American Educational Research Association. Philadelphia, PA.

Swart, M.I., Friedman, B., Vitale, J.M., Kornkasem, S., Lowes, S., Sheppard, S. and Black, J.B. (2014). The M3 Project: Math Movement and Mobile Games. Teachers College Academic Festival. New York, NY.

- Swart, M.I.**, Friedman, B., Vitale, J.M., Kornkasem, S., DiQuallo, K., Sheppard, S. and Black, J.B.B. (2015). Mobile Movement Mathematics: Situating Embodied Learning of Fractions using narrative and gesture in a digital tablet environment. NYC Subway Summit on Cognition and Learning. New York, NY.
- Swart, M.I.**, Friedman, B., Vitale, J.M., Kornkasem, S., and Black, J.B.B. (2015). Mobile Movement Mathematics: Gestures improve Student's Performances on Mathematical FrActions. APS National Conference, New York, NY.
- Swart, M.I.**, Vitale, J.M., Friedman, B., Kornkasem, S. & Black, J.B. (2015). M3-Situating Embodied Learning: Embedding Gestures in Narratives to learn Mathematical Fractions in a digital tablet environment. Proceedings of the Annual Conference of Cognitive Science, July 2015. Pasadena, California.
- Swart, M.I.**, Vitale, J.M., Friedman, B., Kornkasem, S. & Black, J.B. (2015). Mobile Movement Mathematics (M3): Discussing Iterative (re)Design of a Digital Tablet Tutor-Game for Learning Fractions. Proceedings of the Games for Learning Summit, July 2015. Madison, Wisconsin.
- Swart, M.I.**, Friedman, B., Kornkasem, S., Lee, A., Lyashevsky, I., Vitale, J.M., Sheppard, S., Black, J.B., (2016). A Design-Based approach to Situating Embodied learning of Mathematical fractions using Narratives and Gestures in a tablet-based game. 2016 Annual Meeting of the American Educational Research Association. Washington, DC.
- Swart, M.I.**, Kornkasem, S., Hachigian, A., Colon-Costa, N., Black, J.B., Vitale, J.M., DiQuallo, K., Sheppard, S. (2016). ¿Embedding Gestures into Narrative Tutor-games to learn Fractions?! International Conference on Meaningful Play 2016. East Lansing, MI.
- Swart, M.I.**, Kornkasem, S., Hachigian, A., Colon-Costa, N., Black, J.B., Vitale, J.M., DiQuallo, K., Sheppard, S. (2017). ¿When it's the Gesture that Counts?! 2017 Annual Meeting of the American Educational Research Association. San Antonio, TX.
- Swart, M.I.**, Kornkasem, S., Hachigian, A., Colon-Costa, N., Black, J.B., Vitale, J.M., DiQuallo, K., Sheppard, S. (2017). ¿From Abstract to Concrete? Evidence for designing learning platforms that adapt to user's proficiencies. 2017 Annual Meeting of Cognitive Science Society. London, UK.
- Kornkasem, S., **Swart, M.I.**, Black, J.B. (2018). Developing spatial thinking skills using multimedia perceptual models. *2018 Annual Meeting of the International Society for Spatial Cognition*. Rome, ITALY.
- Nathan, M.J. & **Swart, M.I.** (2018). What makes math hard? *2018 Play Make Learn Conference*. Madison, WI.
- Walkington, C., **Swart, M.I.**, Nathan, M.J. (2018). Kinecting Geometry Concepts Using Gestures in Gaming. *2018 Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Greenville, SC.
- Schenck, K.E., **Swart, M.I.**, Binzak, J.V., McGinty, J., Michaelis, J.E., Kwon, O., Visonhaler, R., Nathan, M.J., and Walkington, C. (May, 2019). Connecting to Geometric Proof Concepts using Gestures. Poster presented at NSF Embodied Design for Mathematical Imagination and Cognition Workshop, Madison, WI.
- Xia, F., Nathan, M.J., Schenck, K.E., **Swart, M.I.**, Kwon, O., Michaelis, J.E., Binzak, J.V., McGinty, J., Visonhaler, R., and Walkington, C. (May, 2019). Examining the Effects of Geometric Scaffolds on Gesture Production. Poster presented at NSF Embodied Design for Mathematical Imagination and Cognition Workshop, Madison, WI.
- Schenck, K.E., **Swart, M.I.**, Visonhaler, R., Kwon, O., Binzak, J.V., McGinty, J., Xia, F., Walkington, C., and Nathan, M.J. (February, 2019). Observing Grounded and Embodied Cognition for Geometry Proofs: A Case Study. Poster presented at the annual University of Wisconsin-Madison Education Research Poster Fair, Madison, WI.
- Schenck, K.E., Michaelis, J.E., **Swart, M.I.**, Xia, F., Nathan, M. J., and Walkington, C. (April, 2020). Mathematical Knowledge is Embodied: Synergistic Contributions of Gesture and Speech During Geometry Proof Production. Paper presented at the annual American Educational Research Association Conference, San Francisco, CA.
- Xia, F., Nathan, M. J., **Swart, M.I.**, Schenck, K.E., and Kwon, O. (April, 2020). Does Click Matter? The Role of Text and Diagram on Geometric Reasoning and Gesture Production. Poster presented at the annual American Educational Research Association Conference, San Francisco, CA.
- Swart, M.I.**, *Schenck, K., *Xia, F., Kwon, O. H., Nathan, M. J., *Vinsonhaler, R., & Walkington, C. (2020). Grounded and embodied mathematical cognition for intuition and proof playing a motion-capture video game. In Ilana Horn & Melissa Gressalfi (Eds.), (pp. xx-xx) *Proceedings of the 2020 International Conference of the Learning Sciences*. Nashville, TN.
- Swart, M.I.**, Nathan, M. J., Fitzpatrick, S., & Dolezalek, B. (2020). Building a knowledge base of *Teacher As Learners*. In Ilana Horn & Melissa Gressalfi (Eds.), (pp. xx-xx) *Proceedings of the 2020 International Conference of the Learning Sciences*. Nashville, TN.

Awards

Dean's Grant Award, Spring 2012 "Sensory and Propositional Encoding & Memory Retrieval of Paired-Associate Works of Art"; National Science Foundation Cyberlearning Grant- Exploratory Phase \$550K Award "Mobile Movement Mathematics (M3)"

Extracurricular Activities

President of Teachers College Student Senate '09-11, Communications Officer – Interschool Governing Board of Columbia Student Government '09-11, Chair TC GoGreen Committee '10-12, TC Senate Student Life Committee, TC Senate Diversity Committee, TC Senate Institutional Affairs Committee, Committee for Community and Diversity at Teachers College, President and Provost Committee of Columbia, Musician- "Ferrari Truck"

The University of Virginia, Charlottesville, VA

3.74 G.P.A.

Upper Level Coursework:

Neural Mechanisms of Behavior, Cognitive Neuroscience of Aging, Psychobiology Lab Practical, Psychology of Art, Psychology of Pleasure, Psychology of the Minority Family, Developmental Psycholinguistics, Audiology Research Lab, Advanced Studies in Digital Media; Psi Chi Honors Society:

Extracurricular Activities:

Brown College Student Government Representative (3, 4), Black Voices (3, 4), Madison House Volunteer (2, 3, 4), UVa Pep Band (2-4) Transfer Student Peer Advisor (3, 4), FORCE (3, 4), Contributor: The Declaration
Employment: Teaching Assistant – Art Department (3, 4), Newcomb Hall Building Attendant (3, 4), UVa Catering (3)

Pine View School for the Gifted, Osprey, FL

3.83 uwG.P.A.

Honors Societies

Mu Alpha Theta, Phi Bet Chi, National Honors Society

Extracurricular Activities

Health Care Careers Club (Founder, President, 9-12), Teen Line (Co-Founder, Board Member 9-12), Teen Court (9-11), Student Government: Treasurer (9-10), Intramural Sports (9-12)

Awards

JC Penny National Golden Rule Award, Rotary Outstanding Youth Citizen Award

