**STEM Gender Inequity in Chile**

**A systematic look**

**Oxford Global Challenge**

**Enseña Chile - Teach for All partnership in Chile.

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**References**

**Challenge Mapping: The Problem**

**Higher Education and Math Test Results**

Arias, Ó., Mizala, A., & Meneses, F. (2016) Brecha de género en Matemáticas: el sesgo de las pruebas competitivas (evidencia para Chile).

Comunidad Mujer. (2016). Informe GET, Género, Educación y Trabajo: la brecha persistente. Primer estudio sobre la desigualdad de género en el ciclo de vida. Una revisión de los últimos 25 años. Chile. Available at http://www.informeget.cl/wp-content/uploads/2016/08/Informe-GET-Final.pdf

Comunidad Mujer (2014). Mujer y Trabajo: Estereotipos y Brechas de Género en los rendimientos académicos. Available at http://www.comunidadmujer.cl/biblioteca-publicaciones/wp-content/uploads/2014/06/281.pdf

Consejo Nacional de Educación, CNED. (2005). Educación superior y género: Tendencias observadas. Available at https://www.cned.cl/otros-estudios/educacion-superior-y-genero-tendencias-observadas.

Fine, Cordelia*. (2010). Delusions of gender : the real science behind sex differences. London*

Gender Summit Seminar. (2017, December). Attendance and Networking to Gender Summit 12, on Science Technolgy and Innovation*. Link:*[*http://conicyt.cl/gendersummit12/en/*](http://conicyt.cl/gendersummit12/en/)*.*CONICYT, Santiago, Chile.

IFM. International Monetary Fund. Gender and IFM. Available at http://www.imf.org/external/themes/gender/

MINEDUC (2017). *Ministry of Education, Chile.* Unidad Equidad Género. Educación para la Igualdad de Género: Plan 2015-2018. Recuperado desde http://www.mineduc.cl/wp-content/uploads/sites/19/2017/01/CartillaUEG.pdf

OECD (2015). The ABC of Gender Equality in Education: Aptitude, Behaviour, Confidence, PISA, OECD Publishing. http://dx.doi.org/10.1787/9789264229945-en

OECD. Organisation for Economic Co-operation and Development. Gender Data Portal. Available at http://www.oecd.org/gender/data/

UNESCO (2017). Cracking the code: Girls’ and women’s education in science, technology, engineering and mathematics (STEM)

UNESCO (2017). Institute for Statistics, [*UIS Fact Sheet: Women in Science*](http://uis.unesco.org/en/topic/women-science)

**School and classroom level**

Cvencek, D., Kapur, M., & Meltzoff, A. N. (2015). Math achievement, stereotypes, and math self-concepts among elementary-school students in Singapore. *Learning and Instruction*, *39*, 1-10.

Cvencek, D., Meltzoff, A. N., & Greenwald, A. G. (2011). Math–gender stereotypes in elementary school children. *Child development*, *82*(3), 766-779.

del Río, M. F., Strasser, K., & Susperreguy, M. I. (2016). ¿ Son las habilidades matemáticas un asunto de género?: Los estereotipos de género acerca de las matemáticas en niños y niñas de Kínder, sus familias y educadoras. *Calidad en la educación*, (45), 20-53.

Espinoza, A. M., & Taut, S. (2016). El Rol del Género en las Interacciones Pedagógicas de Aulas de Matemática Chilenas. *Psykhe (Santiago)*, *25*(2), 1-18.

Keller, C. (2001). Effect of teachers' stereotyping on students' stereotyping of mathematics as a male domain. *The Journal of Social Psychology*, *141*(2), 165-173.

Martínez, F., Martínez, S. y A. Mizala. (2015). Pre-service elementary school teachers' expectations about student performance: how their beliefs are affected by mathematics anxiety and student gender. Centro de Economía Aplicada Universidad de Chile. Documentos de Trabajo N° 310.

Nosek, B. A., Smyth, F. L., Sriram, N., Lindner, N. M., Devos, T., Ayala, A., ... & Kesebir, S. (2009). National differences in gender–science stereotypes predict national sex differences in science and math achievement. *Proceedings of the National Academy of Sciences*, *106*(26), 10593-10597.

Nürnberger, M., Nerb, J., Schmitz, F., Keller, J., & Sütterlin, S. (2016). Implicit gender stereotypes and essentialist beliefs predict preservice teachers’ tracking recommendations. *The Journal of Experimental Education*, *84*(1), 152-174.

Schwartz, C. S., & Sinicrope, R. (2013). Prospective elementary teachers' perceptions of gender differences in children's attitudes toward mathematics. *School Science and Mathematics*, *113*(8), 410-416.

Servicio Nacional de la Mujer (2009). Análisis de género en el aula (Documento de Trabajo N° 117). Santiago, Chile: Autor, Departamento de Estudios y Capacitación. Extraído de [http://estudios.sernam.cl/documentos/?eMTE0NDczNw==An%C3%A1lisis\_de\_](http://estudios.sernam.cl/documentos/?eMTE0NDczNw==An%C3%A1lisis_de_Genero_en_el_Aula)[Genero\_en\_el\_Aula](http://estudios.sernam.cl/documentos/?eMTE0NDczNw==An%C3%A1lisis_de_Genero_en_el_Aula)        [ Links ]

Tiedemann, J. (2002). Teachers' gender stereotypes as determinants of teacher perceptions in elementary school mathematics. *Educational Studies in mathematics*, *50*(1), 49-62.

**Household and Individual Level**

BBC Documentaries. (2017, September). No More Boys and Girls: Can our Kids go Gender Free? [Video file]. Retrieved from <https://www.bbc.co.uk/programmes/b09202jz/episodes/guide>

Cerda, G. A., Pérez, C., & Ortega, R. (2014). Relationship between early mathematical competence, gender and social background in Chilean elementary school population. *Anales de Psicología/Annals of Psychology*, *30*(3), 1006-1013.

Del Río, M. F., & Strasser, K. (2013). Preschool children’s beliefs about gender differences in academic skills. *Sex roles*, *68*(3-4), 231-238.

Gunderson, E. A., Ramirez, G., Levine, S. C., & Beilock, S. L. (2012). The role of parents and teachers in the development of gender-related math attitudes. *Sex Roles*, *66*(3-4), 153-166.

Madero, I. (2011). Inclusión y exclusión de género y clase al interior de la escuela chilena en 4 comunas del sur de Chile. *Estudios pedagógicos (Valdivia)*, *37*(2), 135-145.

**The Solutions Mapping: What to do and what is out there**

Aikman, S. and Unterhalter, E., (eds). (2007). Practising gender equality in education. Oxford: Oxfam.

Agencia de Calidad de la Educación (2015). Estudio: Buenas prácticas en la reducción de brechas de género. Recuperado desde http://www.agenciaeducacion.cl/wp-content/uploads/2016/02/Estudio\_Brechas\_de\_Genero.pdf

Comision Nacional Productividad (2017). Informe Recomendaciones para aumentar la participacion laboral femenina en Chile. Available at Informe\_Recomendaciones\_para\_aumentar\_la\_Participacion\_Laboral\_Femenina\_en\_Chile.pdf

Robeyns, I. A. M. (2007). When will society be gender just?.

Stromquist, N. P. (2006). Gender, education and the possibility of transformative knowledge. *Compare: A Journal of Comparative and International Education*, *36*(2), 145-161.

**Links of Initiatives:**

**Higher Education and Math Test Results**

***Government:***

The Gender Equity Office from the Ministry of Education (2015). http://www.mineduc.cl/wp-content/uploads/sites/19/2017/01/CartillaUEG.pdf

*International:*

UN Women (2016). Online Training Centre. https://trainingcentre.unwomen.org

UNESCO. STEM Resources (2017). http://www.unesco.org/new/en/natural-sciences/science-technology/engineering/engineering-education/stem-resources/

***Educational Sector:***

Universidad de Chile, STEM Faculty (2014). Quotas for Gender Equity. http://ingenieria.uchile.cl/admision/admision-especial-pregrado/94355/cupos-equidad-de-genero

**School and Classroom level**

***Government***

Ministry of Education Gender Equity Unit, Online Courses (2017). https://catalogo.cpeip.cl/buscar-todos-los-cursos/?b=genero

District Gender Offices and Women Centres (2017). https://www.minmujeryeg.cl/contra-la-violencia-te-apoyamos/centros-de-la-mujer/

*International:*

PIDPDM. Mexico. (2016). Online platform for teachers to discuss classroom practices related to gender an math. http://www.pidpdm.cinvestav.mx/pidpdmath/propuesta/

***Educational Sector***

Universidad de Chile. Masters and Diplomas on Gender (2011). http://www.cieg.cl

Universidad Alberto Hurtado (2017) Course on Gender and Education. Link: https://postgrados.uahurtado.cl/programa/curso-educacion-para-la-igualdad-e-inclusion-de-genero/

Experimental School *Manuel de Salas* Gender Office (2017). Link: http://www.uchile.cl/noticias/138347/liceo-experimental-manuel-de-salas-se-educa-sobre-genero-y-diversidad

 ***Third Sector:***

Choose your Role (2017). Contributes to gender equality by working closely with the school community for a classroom free of gender stereotypes. www.eligeturol.cl

Ingeniosas, Comunidad Mujer (2017). http://www.comunidadmujer.cl/2017/11/ingeniosas-2017-inspirar-vocaciones-stem-ninas/

Inspiring Girls Chile (2016). http://inspiring-girls.cl

Girls in Tech Chile (2003). http://www.girlsintechchile.com

Escuela Empoderamiento Amanda Labarca (2017) (Empowerment School Amanda Labarca). https://amandalabarca.org

Laboratoria. http://www.laboratoria.la.

*International:*

Inspiring Girls (2017). http://www.inspiring-girls.com/

Ada: The National College of Digital Skills (2003). [https://www.ada.ac.uk](https://www.ada.ac.uk/)

STEMGirls Club. https://stemgirlsclub.com/school

***Private Sector***

# Chilean minister for Women´s Affairs and ALMA encourage gender equality in STEM (2017). Chilean minister for Women´s Affairs and ALMA encourage gender equality in STEM

Companies subscribe for gender equality (2017). <http://m.elmostrador.cl/mercados/2017/03/22/siete-empresas-chilenas-se-comprometieron-con-el-desafio-de-empoderamiento-de-la-mujer-impulsado-por-onu-mujeres/>

**Household and Individual Level**

***Third Sector***

Comunidad Mujer (Women’s Community) Campaign: The Girls Can http://www.lasninaspueden.com

This Girl Can. http://www.thisgirlcan.co.uk

**Impact Gaps and Lessons**

BBC Documentaries. (2017, September). No More Boys and Girls: Can our Kids go Gender Free? [Video file]. Retrieved from <https://www.bbc.co.uk/programmes/b09202jz/episodes/guide>

Comunidad Mujer (2017). 10 Propuestas de Género para un Chile Sostenible Available at http://www.comunidadmujer.cl/wp-content/uploads/2017/09/Propuestas\_Digital\_PL-1.pdf

Espinoza, A. M. & Taut, S. (2016). El rol de género en las aulas chilenas. En J. Manzi, J., & M. R., García (Eds.). *Abriendo las puertas del aula: Transformación de las prácticas docentes* (pp. 449-480). Santiago: Ediciones UC.

Gender Summit Seminar. (2017, December). Attendance and Networking to Gender Summit 12, on Science Technolgy and Innovation*. Link:*[*http://conicyt.cl/gendersummit12/en/*](http://conicyt.cl/gendersummit12/en/)*.*CONICYT, Santiago, Chile.

Unterhalter E, North A, Arnot M, Lloyd C, Moletsane L, Murphy-Graham E, Parkes J, Saito M (2014). Interventions to enhance girls’ education and gender equality. Education Rigorous Literature Review. Department for International Development

***Action-Research: Meetings, Interviews/workshops***

**Meetings**Names are not disclosed to respect privacy of the collaborators.

* Comunidad Mujer (Womens Community) (2017, September).
* Department of Psychology Pontifical Catholic University of Chile (Article Authors) (2017, September). Santiago, Chile
* Universidad Alberto Hurtado, Coordinators and Teachers of Course on Gender and Education (2017, October; 2018, January). Santiago, Chile
* Schools: Manuel de Salas, San Ignacio, Alberto Blest Gana, San Pedro Apostol (2018, March). Santiago, Chile
* Education Management Office, District of Renca (2018, March). Santiago, Chile

**Email exchange**

* Gender Equity Unit, Ministry of Education Chile (2017, December).
* PIDPDM. Mexico. Online platform for teachers to discuss classroom practices related to gender an math (2017, December).

**Workshops/Qualitative Information**

The main lessons were that more time was needed to produce quantitative change and that the problem is so much bigger than just working on the educational spheres. In addition, teachers have tight schedules to plan new material. What they need is short workshops with concrete tools for a classroom free of gender stereotypes.

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| --- | --- | --- | --- |
| **Date** | **Milestone** | **Workshop** | **Observations/Evaluation** |
| April 2017  | Latin American Encounter Teach for All (Santiago, Chile) | Workshop "Gender Gaps" | 15 people from 20 different countries participate.  |
| July 2017 | National Encounter Enseña Chile(Santiago, Chile) | Workshop "Gender Gaps" | 13 Enseña Chile teachers participate (pECh). 84% say "I would like to continue deepening the theme (s) of the (the) workshops in which I participated" |
| December 2017 | Regional Encounter Enseña Chile (Santiago, Chile) | Pilot Workshop 1: "Visualizing Effects of Gender Stereotypes" | 30 future Enseña Chile teachers participate. There are positive qualitative changes, but there are no significant changes in quantitative measurement of gender bias.  |
| January 2018 | Summer School Enseña Chile: Elective courses for training future teachers(Santiago, Chile) | Workshop 1: "Education and Gender: ChallengingStereotypes"Workshop 2: "Concrete actions for a classroom free of gender stereotypes" | 25 future Enseña Chile teachers participate. There are positive changes in the qualitative, but there are no significant changes in quantitative measurement of gender bias\*. |

\*Instrument elaborated and shared by Womens Community (Comunidad Mujer) (2017)