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Breaking Gender Boundary by Gender Mobility into Technology—Elite Girls' Powers in Undergraduate Experiences in Taiwan

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Abstract. The awareness of issue in this paper is based on empirical investigation on the historically gender inequality in the field of technology. The technology-gender gap and gendered technology still exist in Taiwan. Addressing the policy of gender mainstreaming, this paper focuses on the gender-technology relations. It also questions the "technology as a masculine culture" and "technology as a male institution". Based on the sociological and feminist approach, this paper aims to explore how the female articulate the formation of the gendered technology phenomenon. It concludes that girls co-constructed and deconstructed simultaneously the gendered technology and this construction is subtly corresponded to the changing schooling and societal expectation outside the education.

Keywords: elite girls, female undergraduates, femininity/masculinity, gendered technology, gender mobility

1. Introduction

Taiwan is well-known as a kingdom of technology that reflected not only in the curriculum structure but also in the gender allocation of university subjects. Responding to emerging social issues such as gender mainstreaming and gender equality in the multicultural and e-society, the *2004 Gender Equality Education Reform* operated within Taiwan's particular socio-political context had corresponded to the revolution of gender structure in the field of technology and science. Addressing the policy of gender mainstreaming since 1985, this research project focuses on the gender-technology relations. It questions the "technology as a masculine culture" and "technology as a male institution". This project aims to explore the contemporary discourse of gender boundary and gender mobility in technology, drawing the girl discourses on technology, gender, and success.

After 7-year practicing *Gender Equality Education* in schools, more female technologists are working in universities as well as more girls are getting into technology in universities. However, according to previous research (Wang, 2010), female technologists are rather corresponding to the patriarchic society than challenging gender inequality. Empirical study (Wang, 2010) shows that female technologists have advantages in successfully demonstrating both femininity and masculinity more naturally than males. While they succeed in technology, they experience failure in female identity. Gender mobility is seen in those who survive in the social structure of strict gender boundary.

Followed by the above study on the gender discourses of woman technologists in Taiwan's universities that reflect a masculine technology which intensifies masculinity yet mitigates femininity, this research focuses on the female undergraduates' gender discourses on learning technology and science, by exploring if they were aware of gender equality or are they just corresponding to the patriarchic society? According to the gender analysis on the university subjects in Taiwan, we can see that the gender gap in technology is not

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closing up at all. It is significant to understand how elite girls break the gender boundary and how they could create gender mobility. It is dealt with gender performance about technology learning. This paper aims to analyze the gender-technology discourse of girls into technology and explore female success to the gender-technology relation and gender identity (femininity/masculinity).

2. Methodology and Methods

Based on the sociological approach of technology, this research uses a Critical Discourse Analytical (CDA) framework to analyze the gender-technology discourses. CDA framework is used to analyze any sort of discourse as it is proved as a successful tool of ideological analysis (Wang, 2008). The established CDA framework constitutes three stages: epistemological selection, methodological processing, and discourses induction.

In this research, empirical data about the gender-technology discourses were collected by individual interviews, situated interviews and focused group discussions from 20 selected *elite girls (female undergraduates majoring in technology in Taiwan's top universities)*. They were asked about their life experiences of doing technology, doing gender and performing femininity or/and masculinity. Interviewing items were focused on the following questions:

- the elite girls' learning experiences on technology and its dilemma, motivation and social model
- the successful self of the elite girls in the field of technology
- how much the elite girls depend on their femininity or masculinity toward success.
- how the elite girls make use, transform, or discard their femininity during their career in technology
- To interpret the gender boundary and gender mobility as well as mapping the gendered culture in the technology field.

3. Research Findings and Discussions

Based on the contextual data with a CDA analytical framework, this research found that the elite girls didn't grow up with specific gendered subjectivity and identity which was yet found in the woman technologists' family, schooling and social contexts. Most of the elite girls have strength in family support for technology learning. During their learning career in schools, they met some (but few) female technologists or scientists as social models. Some of the elite girls were aware of gendered inequality which existed in their family or the wider society, yet most were not. It depends on their gender consciousness and critical consciousness (Gill & Grint, 1995).

Regarding the epistemology on technology, the elite girls were not aware that technology as a masculine field, though the discourse of "men good at technology" was found in their narration. It shows that the elite girls' epistemology on technological knowledge is a biological perspective. Nevertheless, as McNeil (1987) notes, we should question the taken-for-granted assumption of man/masculinity linking with technology knowledge.

Regarding the gender discourse, the elite girls interpret technology with man's words. We can find that the field of technology recently appears to include girls more than ever but technological girls performed more masculinity than femininity. Figure 1 is an example of differentiation of masculinity/femininity in gender discourses.

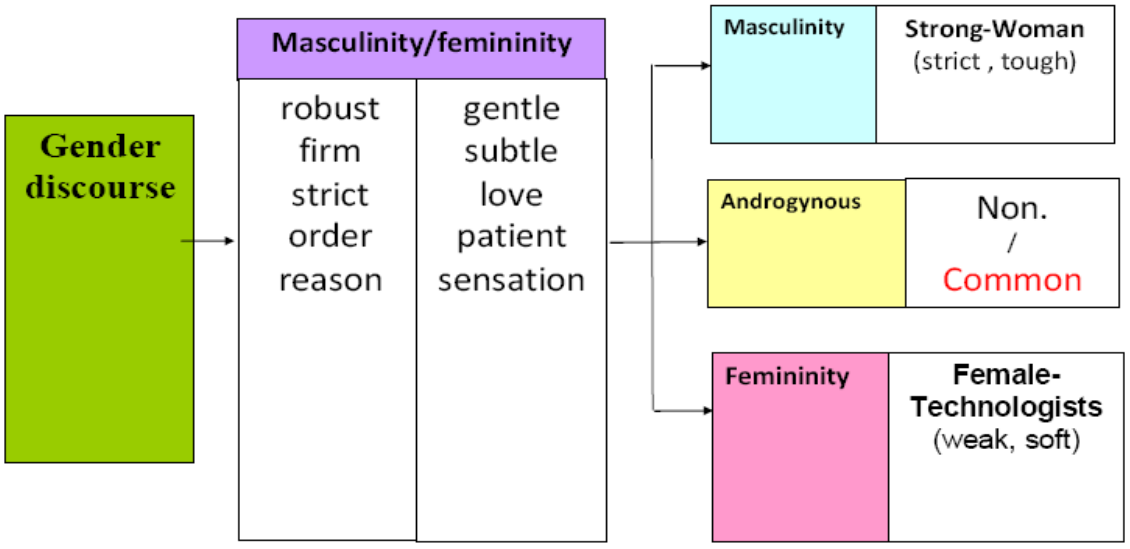

Fig 1. Differentiation of masculinity/femininity in gender discourses

F1 shows the differences of gender discourse between two generations. In the older generation, the discourse of strong-woman predication on the one hand recognizes female scientific characteristics and qualities by using appreciative language, yet on the other hand excludes certain female traits and discourages female identity by using derogatory language. The stigmatized woman for female technologist somehow is the phenomenon of trap door (Guy, 1994) that could crackdown female mobility to technology. However, the younger generation of elite girls in Taiwan's universities maintain more androgynous in terms of gender discourse. It means that the discourses of female-technologist nomination and strong-woman predication are no longer bother the younger generation. The boundary between masculinity and femininity for the younger generation is getting blurred. They also benefit from the need for developing female technology in current market. The above findings show that the female disadvantage in the invisible culture of gendered technology is mitigated.

Regarding the ontology of gender hierarchy, the older generation of female technologist addresses masculine personality for high authority in terms of professional authority. Therefore most female technologists perform masculinity more than femininity as F2 indicates.

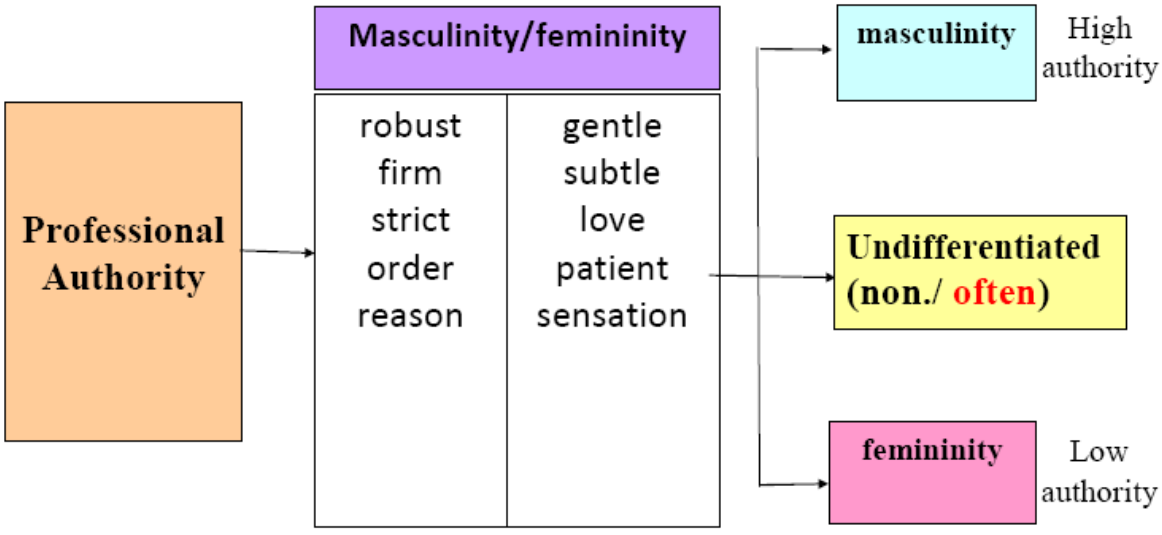

Fig 2. Differentiation of masculinity/femininity in teaching authority

This result explicates an alternative pattern of gender hierarchy that masculinity is superior to femininity. It is somehow corresponding to Vaerting's (1923) research that those who perform masculinity become the dominant sex, yet that performs femininity is subordinate. However, F2 shows that the discourse of "masculine teachers for high authority" and "feminine teachers for low authority" does not any longer dominate younger generation. The distinguishing of professional authority between masculinity and femininity is getting more undifferentiated.

As we knew that patriarchic gendered structure can reproduce its corresponding gender ideology—male is superior to women in the public field of technology as well as in the wider society (Massey, 1994). We can see that gender inequality is still in place but is improving in the site of university after *Gender Equality Education Act* for years in Taiwan. Compared to the older generation of female technologists, the younger generation of elite girls in current universities is friendly accommodated in technology without demanding for masculinity performance. Although female students in the field of technology are quite minor quantitatively, the elite girls felt more advantages than disadvantages because they get more care and support from both male and female elders and teachers. The elite girls were not afraid of the male students around them at all. Limited to the university environment, the elite girls were not aware of gender discrimination as those woman technologists working in universities. It seems to them that university provides friendly climate for learning technology and getting along with males.

In the current universities, masculinity is no longer penetrated the technological fields through gender discourse and authority structure. Nevertheless, elite girls are still under the protection of educational umbrella. They might not experience the social exclusion by gender in many aspects, especially in the academic seminars or workforce, where males best perform their masculinity. Shall girls, as Weinstein (1988) relating femininity to an empty space and silent object, become man (masculine) in order to get access to the stage of success?

4. Conclusion

In conclusion, elite girls have broken gender boundary by GIST thank to their personal interest, family support, school empowerment from which they have gained power in the field of technology. Gender mobility is seen in the elite girls who survive in the social structure of loose gender boundary. Femininity is more welcome in the daily life of elite girls than that of female technologists. Responding to the changing economy, there are more market needs for female technology instead of male technology. It seems that technological girls have promising future.

It is worth of thinking further that what the elite girls' future would be? Would the female be as advantageous in the future society as the campus where they were? Can GIST genuinely break gender inequality? GIST can be sort of gender discrimination as long as women's success has to access by way of being masculine (Connell, 2006). If the society keeps the liberal equality which do not require 'degendering' in men's mind, girls have to take the masculine version gender identity in order to work for the masculine technology(Wajcman, 1991). Therefore, we suggest, as Phipps (2008) did, that GIST can change nothing if we don't challenge the linkage of patriarchy into technology professionalism.

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