

# A Comparative Study of Language Use Observed in Publicity of Keihanna City

Sakura HAYASHI<sup>a\*</sup>

<sup>a</sup>*Colleges of Humanities, University of Tsukuba, Japan*

\*s1710082@s.tsukuba.ac.jp

**Abstract:** This paper investigates how language use of publicity in Science City changes. Specifically, how the change of language use and its background idea of the city construction are related on the basis of two modal cases of government-driven research Science City; Tsukuba City and Keihanna City. This paper makes use of the language used in the publicity of Keihanna City and the original idea of the Keihanna Plan for Creating a New Research City and attempts to compare with that of Tsukuba city. As a result of this study, it is reported that, among three ideas of “research”, “collaboration with local residents” and “culture”, the “research” component has become more diverse and largely integrated. On the other hand, the components of “culture” has remained undeveloped so far. Lastly, it is implied that in the case of Tsukuba City, due to the main focus placed on the original idea of easing congestion of the metropolitan area, much of the last two components has not been apparent from the publicity.

**Keywords:** Keihanna City, Urban City Planning, Language Use, Publicity, Textmining

## 1. Introduction

### 1.1 General Overview

Tsukuba Science City (hereinafter called Tsukuba City) was constructed to ease congestion in Tokyo and to conduct high-level research and education by transferring national research and development, as well as educational institutions. Tsukuba City is now the largest science technology accumulation site in the country, where it has more than 300 public and private institutions and enterprises (<http://www.tsukubainfo.jp/tsukuba/tsukuba.html>). Yamamoto et al (1992) state that Tsukuba City is a particularly unique city due to its development under the Japanese government’s strong initiative. According to the document made by the National Capital Region Redevelopment Commission (1970), Tsukuba City was designed and constructed under the idea of a “well-balanced garden city” (The Act on Construction of Tsukuba Science City, 1970), a planned development of urban and surrounding greenery in a functional, culturally integrated city. The comfortable rural environment with modern urban facilities can be healthily enjoyed equally by all residents. Mitsui (2015) argues that while Tsukuba City aims to keep its surrounding greenery under the concept of “Garden City,” it attempts to become “independent” as a Metropolitan area and an “internationalized” city. After the construction of Tsukuba City, other similar types of science cities were modelled after it. Of them, one of the most famous is Keihanna City. This paper first reviews the situation of Tsukuba City and its challenges for the future. Then, we will examine publicity documents published in Keihanna City using the textmining method and how their language use has changed over the time of its development. Lastly, this paper concludes with implications for better understanding of how science cities in Japan are promoted through publicity.

## 1.2 Challenges of Tsukuba City

The original intention of Tsukuba City is to be an independent and international garden city. The land use in Tsukuba is unlike that of any other city in the world; the uniqueness is that its settlement area is in the center of the science city, and the job area is peripheral (Yamamoto et al., 1992). The population here is still increasing, while generally decreasing in other Japanese science cities (Statistics Tsukuba, 2019). Due to its specific backgrounds, Tsukuba City has the following types of apparently contrary characteristics such as “Japanese traditionality and internationality,” “science and culture,” and “locality and universality” (The Japan Industrial Structure Institute, 1990).

As far as these observations are concerned, the government development in the Tsukuba area looks successful so far. However, there are several problems that need to be solved for the future development of the science city. As described, Tsukuba City was developed under the government’s strong leadership and the Act on Construction of Tsukuba Science City (1970) clearly stated that the development of Tsukuba Science City, as a well-balanced garden city, directly leads to the reduction of overpopulation in the developing and expanding metropolitan area. During the development process, the city has attracted more residents, both foreign and domestic. There has also been construction of several research institutes and national and private universities. However, especially after the Tsukuba Express was operated in 2005, the situation seems to have changed. Firstly, some residents moved out of Tsukuba and an increasing number of students started to commute from the metropolitan area to work or study, instead of living in the garden city. The population of Tsukuba appears to be increasing compared with other cities, but the crucial point is that the “rate” of increase in the number of residents who should be living and working in Tsukuba City is not so large. This means that Tsukuba City has not been independent recently as the statements by the law should expect and some other actions are needed to increase the comfort of Tsukuba City.

In summary, Tsukuba City has not adapted well to the accommodation of population and the provision of comfort. Moreover, Tsukuba City has become a commuter city after Tsukuba Express opened, and while it had been expected to grow as an “independent” city at first, it now faces the serious contradictory situation of the initial garden city idea and the reality of urbanization.

## 1.3 Comparison with Keihanna City

In evaluating how Tsukuba City has developed so far, it is necessary to compare the city with other types of science cities that were constructed and developed under the government’s initiative. In this study, I focused on a city from the Kansai Area, Kansai Cultural Science and Research City (hereinafter called Keihanna City). Keihanna City is in the Keihanna hills stretching over Kyoto, Osaka, and Nara prefectures in western Japan. Keihanna City was constructed and maintained under the Kansai Science City Construction Act (1987) as Japan’s national projects – much like the Tsukuba Science City in the east of Japan ([https://www.kri.or.jp/en/whats\\_keihanna/](https://www.kri.or.jp/en/whats_keihanna/)). Boasting more than 140 research facilities, including universities and cultural facilities, the city has accomplished remarkable success in the fields of cultural and scientific research.

The differences between the two cities are summarized as follows: Tsukuba City was constructed under the idea of “garden city” and was intended to become “independent” to solve the issue of overgeneralization of the metropolitan area. In contrast, Keihanna City was constructed under the idea of strengthening culture, academy, and research functions and promoting Japan’s economic potentials. In addition, the Keihanna Plan for Creating a New Research City ([http://www.mlit.go.jp/crd/daisei/daikan/aratana\\_plan.pdf](http://www.mlit.go.jp/crd/daisei/daikan/aratana_plan.pdf)) clearly states that the City should enhance collaboration with residents to foster the band of research city. Thus, the three unique points of Keihanna City are: (1) Science and technology, (2) Collaboration with residents, and (3) Culture.

## 2. Purpose of This Paper

Although these two cities are similarly developed under the government's initiative, their situations differ. The purpose of this paper is to examine how these differences appear in publicity documents. This paper poses the following two research questions:

1. What changes are observed in the language use in Keihanna View from 2017 to 2019 during the city's recent development?
2. How are the changes related to the social or political ideas behind the observed change of language use?

## 3. Procedure

### 3.1 Data Collection

This paper examines the quarterly publicity of "Keihanna View." This was published by the Public Foundation of Kansai Research Institute, which promotes the culture and research administration of Keihanna City. I visited the office and collected paper-based literature in addition to the web-based one. Then, I interviewed two of the executive staff to better understand the history and geographical background of Keihanna City. Kansai Academic Research Survey Meeting (so-called Okuda-Kondankai) provided detailed resources.

Keihanna View has been published four times a year in March, June, September, and December since 2007. Thus, the materials from vol.1 in MM 2007 to vol.43 in December 2019 were collected and converted into a database. Keihanna View is comprised of two types of content: contributions and special issues. The special issues are concerned with the important events or activities about Keihanna City, company introductions, and its culture introductions and news. Figure 1 shows the corpus constructed in this research. The number of collected words is 14,657.

text	year	volume	page	text type
寄稿	2019	43	0	見出し
けいはんな学研都市を活性化する教育機関	2019	43	0	タイトル
関西文化学術研究都市(けいはんな)は筑波	2019	43	0	本文
つくばは、国策主導、一極集中、筑波大学	2019	43	0	本文
けいはんなは、民活主導、12クラスター、	2019	43	0	本文
けいはんなはその名称から「文化」が特徴	2019	43	0	本文
東京在住の研究者から、次のように関西を	2019	43	0	本文
関西はいいね。	2019	43	0	本文

Figure 1. Screenshot of the corpus constructed in this paper.

### 3.2 Analysis

KH-coder (version 3) was employed in the analysis. The target data are those from March 2017 through December 2019, when the third development plan in Keihanna City was introduced. The resources were divided into the following three periods: the first period (2017), the second period (2018), and the third period (2019). In this research, we analyzed the frequency of words and co-occurrence network.

## 4. Result and Discussion

### 4.1 Descriptive Result

The result of co-occurrence network analysis is given below in Figures 2, 3, and 4 for the years 2017, 2018, and 2019, respectively.

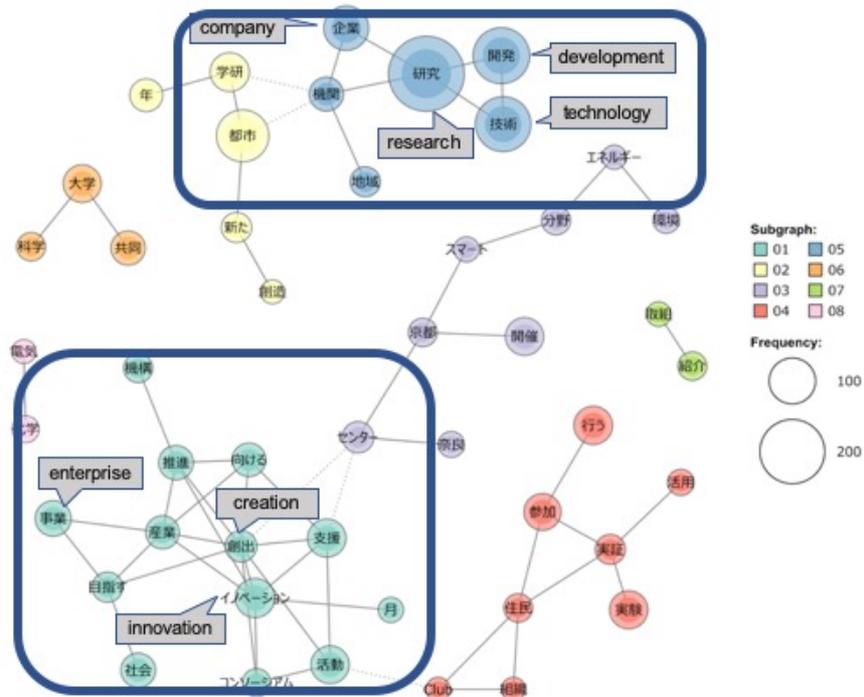


Figure 2. Cooccurrence network for 2017.

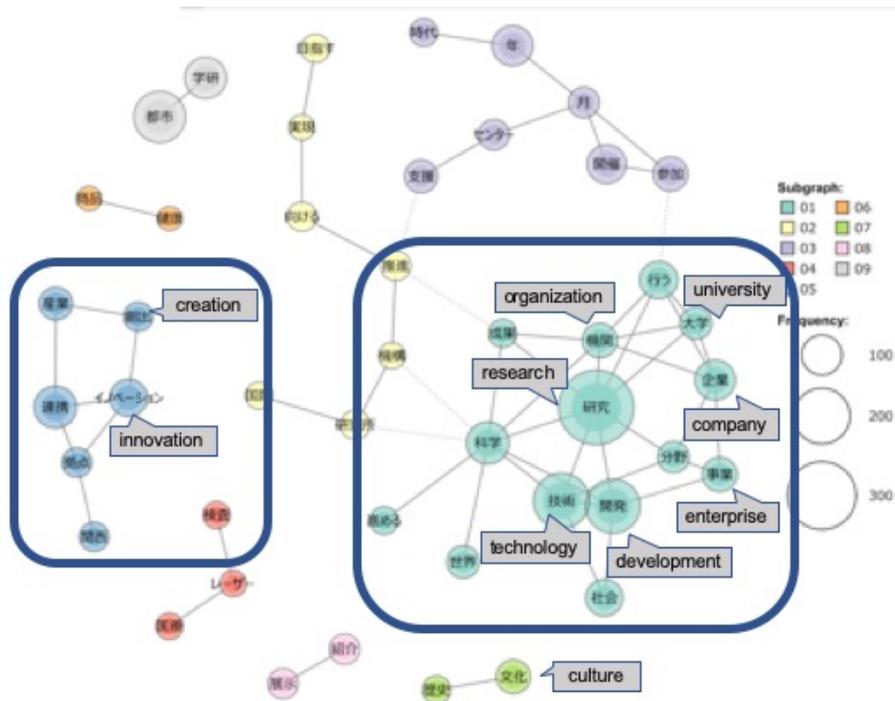


Figure 3. Cooccurrence network for 2018.

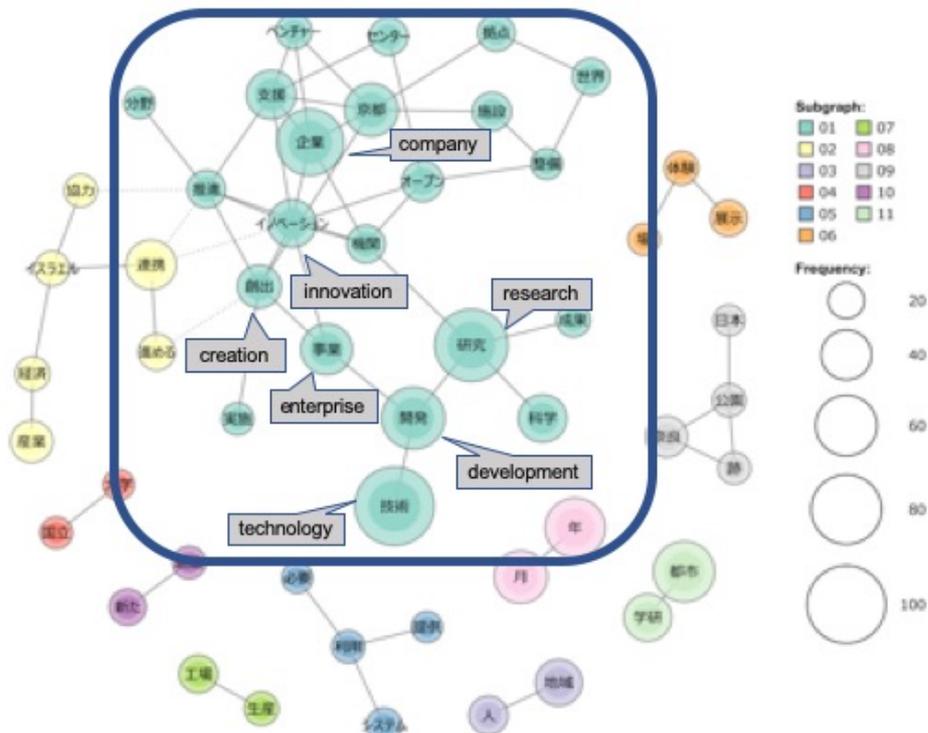


Figure 4. Cooccurrence network for 2019.

As shown above, there are some word clusters, which we call “islands,” and changes are observed in the size and constituents of each island. In 2017, the biggest island is the one whose central word is “research,” and the second is “innovation.” The clear change from 2017 to 2018 is that the range and number of constituents became larger and more integrated; in 2017, the constituents of the “research” island were “company,” “technology,” and “development,” whereas in 2018, more words such as “university,” “organization,” etc., appeared in the “research” island. The second biggest “innovation” island became smaller and some words like “enterprise” moved into the “research” island. This observation implies that the change of language use changed the way that the “research” area has become larger and more integrated, as is expected from the policy depicted in the Act.

Then, in 2019, these two independent islands were merged into one big “research” and “innovation” island, as shown in Figure 4. In addition, the island became increasingly nested and combined with a lot of other related words. This is also considered an expected reflection of the Action Plan, which states that the city should be highly integrated to become a “science city.”

Note that the frequency of words is generally equal between years, as shown below in Tables 1, 2, and 3 for the years 2017, 2018, and 2019, respectively.

Table 1: List of Words on the Related Islands in 2017

word (original)	translated English	raw frequency	rel frequency
研究	research	276	6.402
開発	development	152	3.526
技術	technology	146	3.387
企業	company	94	2.180
機関	organization	53	1.229
地域	region	41	0.951
イノベーション	innovation	72	1.670
機構	facility	38	0.881
推進	promotion	55	1.276
事業	enterprise	59	1.369
産業	industry	51	1.183
創出	creation	45	1.044
支援	support	68	1.577
社会	society	55	1.276
コンソーシアム	consortium	36	0.835
活動	activity	67	1.554

(N = 4311, per 100 words)

Table 2: List of Words on the Related Islands in 2018.

word (original)	translated English	raw frequency	relative frequency
研究	research	365	6.265
技術	technology	198	3.399
開発	development	189	3.244
科学	science	113	1.940
企業	company	102	1.751
社会	society	85	1.459
機関	organization	75	1.287
事業	enterprise	74	1.270
世界	world	65	1.116
大学	university	63	1.081
分野	field	61	1.047
成果	outcome	48	0.824
連携	cooperation	113	1.940
イノベーション	innovation	88	1.510
産業	industry	68	1.167
拠点	base	54	0.927
関西	Kansai	53	0.910
創出	creation	52	0.893

(N = 5826, per 100 words)

Table 3: List of Words on the Related Islands in 2019.

word (original)	translated English	raw frequency	relative frequency
研究	research	225	4.978
技術	technology	161	3.562
開発	development	117	2.588
企業	company	114	2.522
京都	Kyoto	87	1.925
支援	support	70	1.549
イノベーション	innovation	69	1.527
事業	enterprise	65	1.438
科学	science	55	1.217
センター	center	45	0.996
推進	promotion	45	0.996
拠点	base	43	0.951
機関	organization	43	0.951
創出	creation	41	0.907
施設	faculty	37	0.819
世界	world	35	0.774
オープン	open	35	0.774
整備	maintenance	33	0.730
成果	outcome	32	0.708
ベンチャー	venture	25	0.553
分野	field	25	0.553
実施	implementation	18	0.398

(N = 4520, per 100 words)

## 4.2 Discussion and Implications

First, the Kansai Science City Construction Act states as a basic concept of Keihanna City that it should be culturally integrated as a research city. As is shown in Figure 3, the island of “culture” appeared at the bottom of the picture. It might seem that this is also a sign of cultural integration, but the fact is that the special section concerning culture appeared in publicity only in that year and the island disappears 2019 onward. That means that after the special edition was finished, no such words like “culture” appeared in publication. It might be possible to conclude that the language use and its social or political background does not sufficiently match. The author feels that the publicity should promote the “cultural” aspect of the Keihanna City more.

Second, as was reviewed in 1.3 above, the city attempts to collaborate with residents to promote the brand of Keihanna Research City. As to the collaboration with residents, again, there is no such island appearing in the picture connected to the “research” island. This might mean that the aspect of collaboration with residents is still on the way to reach the goal depicted in the action plan.

In comparison to Tsukuba City, the publicity appearing in Keihanna City shows the change of language use based on the action plan as the city develops. On the other hand, Tsukuba City has been trying to attract people to live in Tsukuba to ease congestion of the Tokyo metropolitan city. However, it seems to me that the publicity does not sufficiently present the benefits of moving into Tsukuba City to live a comfortable and healthy life. In the future, more research is necessary to investigate how language is used in the publicity of Tsukuba City for the purpose of providing a picture for the city.

## Acknowledgements

I would like to express my sincere gratitude to Prof. Yuichi Ono at University of Tsukuba for his valuable advice on this research, and to Mr. Takahiro Himeno at Public Foundation of Kansai Research Institute for precious information and cooperation.

## References

- Gakuen City Problem Study Group (1985). *Tsukuba Science City*. Tokyo: Otsuki Shoten
- Mitsui (2015). *The Urbanism of Tsukuba Science City* (Tsukuba Kenkyu Gakuen Toshi Ron). Tokyo:Kashima publishing.
- The National Capital Region Redevelopment Commission (1970). *Unified Views on Doubts of Relevant Ministries and Agencies on the Tsukuba Science City Urban Construction Law* (Tsukuba Kenkyu Gakuen Toshi Kenchikuho-ni Kakawaru Kankeikakusyo-no Gigitou-ni Taisuru Touitsukenkai).
- The Japan Industrial Structure Institute (1990). *Retrospective and Prospects of Quarter Century of the Tsukuba Science City* (Tsukuba Kenkyuu Gakuentoshi shihanseiki-no Kaiko-to Tenbo) Vol. 222
- Yamamoto, S., Takahashi, N., Nakagawa, T., Hashimoto, Y., Haga, H., Kajima, H., and Sobajima, Y. (1992). “The land scape of Tsukuba Research Gakuen City”. *The Report of Regional Research*, (14), 1–8.