

Popularity of Emoji in Cyberspace: Is a New Age of Picture-centered Communication Coming Soon?

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1. Introduction

The use of graphic emoticons, or emoji is becoming more and more popular these days. Emoji are especially common in the SNS postings of young Japanese women and we even feel as if it were impossible for them to communicate without emoji in cyberspace. Emoji are mainly used as a softener of communication in SNS, blogging, or messaging services, showing the emotional state of the sender. In addition to this type of paralinguistic usage, emphatic usage or dual coding usage of emoji is increasing, with a certain emoji representing the meaning of the preceding word used again just after the word and thereby producing repetition of a certain lexical entity. Some users also like the ideographic usage of emoji, using an emoji as an independent pictographic word. It is as if emoji are rapidly permeating the cyberspace communication which used to be, in principle, conducted with characters. In fact, at the time when ASCII-based emoticons prevailed, ideographic emoticons were seldom found. It seems our communication has been becoming more and more picture-oriented almost before we realize it.

As we can see in our ordinary life, symbols and signs always surround us and they are supporting our life. These include simple non-smoking signs seen at various places, traffic signs, pictorial signs showing facilities at a train station or at other public places as well as secret signs made by baseball players ordering what kind of pitch should be delivered next. For example, when we want to switch on an electric device, we are likely to encounter a power switch shown in Figure 1.



Figure 1. Example of a switch for an electric device

In fact, we have gradually learned the meaning of the mark of the “line” and the “circle” and come to push the “line” side to turn the device on. This learning occurs even with people who do not actually know the “line” mark denotes 1 (one) and the “circle” mark denotes 0 (zero). In the past, as shown in Figure 2, we used to print “power on” or “off” next to the power switch to show clearly which side is for power on or off.

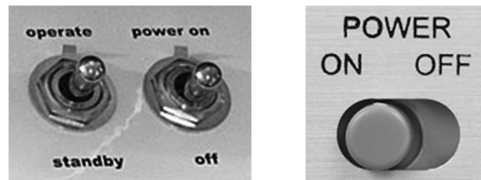


Figure 2. Examples of old power switches

Today we even have a “toggle” type power switch with the “line” mark and the “circle” mark integrated in one mark (see the example of Figure 3).



Figure 3. Example of a toggle type power switch

Although we do not have a formal training of learning signs and symbols, people nearly all over the world understand the meaning of the following toilet sign (Figure 4) and the male/female distinction is clearly recognized. When we visit a public building, we inevitably encounter the sign of an emergency exit such as shown in Figure 5. But how did we learn the meaning of this pictogram? Or how many people in the world had formal learning where they studied the meaning of this symbol? Perhaps since childhood, people were exposed to this symbol together with the literal description of an “emergency exit” in their own language. Through this kind of repeated exposure, people probably have gradually and unconsciously learned the meaning of the sign.



Figure 4. Example of a popular toilet sign



Figure 5. Example of an emergency exit sign

One exceptional situation where signs are learned systematically and intentionally is when we remember the meaning of the traffic signs. Without the correct knowledge of the traffic signs we will not be able to pass the examination for a driver's license. However, once we have mastered the meaning of the traffic symbols, we normally do not forget the meaning of each sign. This shows the evidence of the ease of learning the meaning of the signs, and because of this, traffic signs did not adopt the idea of just showing a certain concept in language but employed picture-like drawings.

Another case of commonly used signs and symbols in today's society is the use of maps. Formal maps are of course a typical example of showing geographical complexity in quite a simple and intelligible manner. However, in our modern life, we are also surrounded by many map-like displays. For example, Figure 6 shows a subway map of Tokyo. In fact, each line is given a specific color and owing to this use of different colors, we can easily understand which line to take in order to get to a certain station. We can also recognize which stations share multiple lines and this information helps us plan the transfer when we cannot get to the destination just by taking one line.

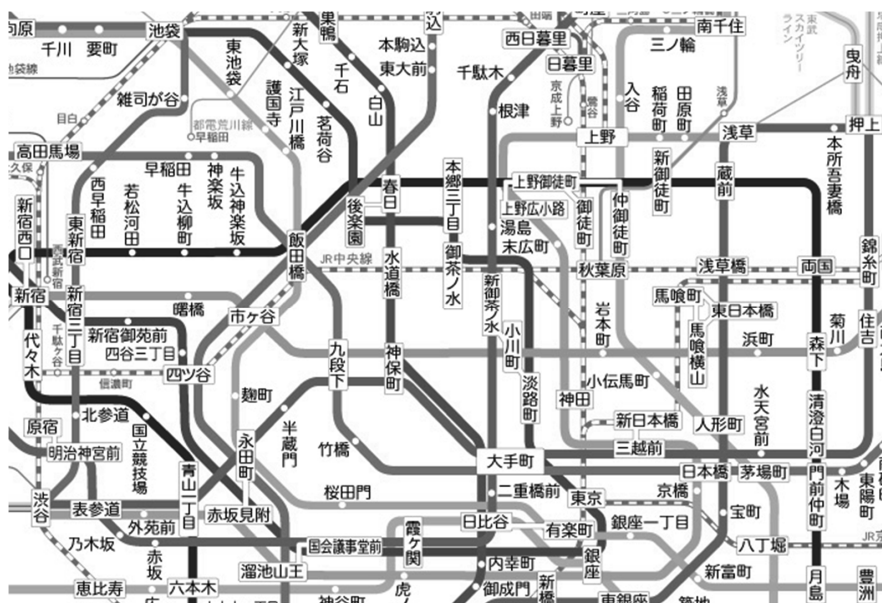


Figure 6. Part of Tokyo subway map

(from http://www.meik.jp/2rosenzu/jpg_640/chika_tokyo.jpg)

In a sense, we are witnessing a dramatic increase of various kinds of symbols and signs in our ordinary life of today, as globalization of economic activities, transportation and people's movement is accelerated. These days, fewer words are used for the interface design of digital cameras, instructions of treatment for washing clothes, or the control panel of an automobile with various switches. Instead, more and more symbols and signs are used for simple instructions for the apparatuses used in our everyday life. Of course, the popularity of picture-based communication is not limited to the commercial domain. Even in our daily communication via mobile devices and computers, which was implemented only by written language in the past, more and more picture-based communication is proliferating. The following sections will reveal how signs and symbols are invading the communication in our cyberspace that was dominated by characters until quite recently.

2. Signs and Symbols in Cyberspace

Our communication style has greatly changed through the use of the Internet over the last decade because of the emergence of new tools for communication such as blogging, social bookmarking, social networking service, mashup service and so on. In the not so distant past, our Web page stood alone as a single static page without a device to encourage interactive communication with visitors, only to be accessed by anonymous people in

principle. Today, various types of dynamic social networks in terms of business activities, hobbies or special interest have become possible on the Web because of the above-mentioned technological developments. Without introducing an expensive groupware system, we can now form a group on the Internet and within this cyberspace, we can communicate with each other and sometimes actually manage a project in an organized manner, even free of charge.

There has also been a dramatic change in the way we search for information on the Internet. We are establishing various tagging technologies to describe metadata of an object on the Internet. It seems that we are moving in the direction of separating the object itself and its metadata. However, the metadata or tags connected to the actual object, even though they are not hierarchically structured, are so nicely organized that today's searching technology has greatly increased the range of the searchable objects on the Internet. Today we can search for desired pictures, even video clips or music pieces quite easily. We also begin to feel that so-called "collective knowledge" implemented through social bookmarking is not only possible but also more informative than we first expected.

In a sense, as automobiles became the extension of our legs and feet, and as computers or mobile devices became the extension of our brain, the computer networks or cyberspace is now becoming the extension of our real world. Or for some people, cyberspace may even mean more and be more important than the real world. Efficient businesspeople are relying more and more on computer networks, and those who organize their business calendar online using Web-based calendar service of famous portal sites, such as Yahoo! Calendar or Google Calendar are not rare these days. As businesspeople become busier, they also tend to rely on the reminder service of these portal sites, much as if their schedule were carefully organized by a capable secretary.

2.1. Core Components of Cyberspace

As we can see, we are relying increasingly on various functions and benefits of the cyberspace. It is not too much to say that at no other time in history have we witnessed such a strong reliance on technology and such a keen attachment to cyberspace. But what is cyberspace made of? It is of course filled with various types of files and huge amounts of information. However, in principle, it is written language that makes up cyberspace and it is impossible to bring cyberspace into existence without language. We communicate with language when we use our e-mail or blog. We search for necessary information and desired files by means of language and we "social-bookmark" using language.

2.2. Nature of Cyberspace Communication

Communication in cyberspace by means of written language has some unique features. Once transmitted, it is impossible or nearly impossible to recall the message when we use twitter or popular social networking services. Non-verbal features such as gesture, posture or facial expressions are rarely visible in cyberspace communication. Unless we use multi-mode messaging services or other types of audio-visual modes of communication on the Internet, we cannot convey prosodic features such as intonation, rhythm or stress in cyberspace. This situation naturally leads to the difficulty of comfortable and smooth communication in cyberspace, since it is known that the contribution of the purely linguistic elements to our actual face-to-face communication is much smaller than the speech-accompanying non-verbal behavior (Mehrabian, 1971).

Naturally, it is rather difficult to have language-only communication online especially if both parties have just encountered each other for the first time and share little information about one another. In real life, the first encounter will of course put some pressure on both parties but probably with the help of paralinguistic and prosodic information accompanying the language, they will understand one another gradually and the communication between them will become rather smooth in a short time.

In cyberspace we often encounter a very violent argument or a furious verbal fight. Such a fight might not arise if both parties had encountered each other in real life and began the discussion face-to-face. In such a severe verbal fight in a social networking service, we very often see a posting like “I did not mean that in my previous posting.” Then the clarification or meta-clarification of the past postings may add more oil to the flames and the situation might become uncontrollable.

2.3. Emoticon as Paralinguistic and Prosodic Features in Cyberspace

Emoticons or smilies have gradually entered cyberspace to provide the language-only and seemingly logic-only cyberspace communication with an emotional and human touch. In a sense, emotions are considered to be functioning as prosodic or paralinguistic features of spoken language. Like in a sentence “This paper looks quite strange ;-)” they are often added at the end of a sentence or a phrase to show the emotional state of the writer. Thus, an emoticon is considered to be a typographic and ASCII version of a paralinguistic feature. In East Asia, especially in Japan, people have developed their own style of emoticons, or in the Japanese language, “kaomoji” (face mark or face character). Normally these East Asian

emoticons are to be read vertically like a sentence “Well, this paper is not so bad as you might think (^_^).” Although their style is different from the Western style, these are also quite intelligible to people all over the world. Figure 7 below shows some examples of the East Asian emoticons.

(^_^) or (^.^) or (^.^) or (^.^)	smiley
(@_^)	zombie smiley / smiley with eye hanging out (originally typoed)
(^.,^)	vampire smiley
(^_^) or (^_~)	wink (or alternatively quirked eyebrow in latter case)
(>_<) or (>_>)	in pain, or frustration
(<_>)	sad
(_/)	evil
(-_-)	semi-angry or upset or sighing
(H_H)	pervert (from Japanese "hentai")
(///_\\)	emo
(^o^)	singing, or laughing maniacally
(~_O) or (~_Q)	one-eyed pirate or monocle user in latter case.
\\(^o^)/	very excited (raising hands)
(-_-) or (~_~) or (=.=)	annoyance, resignation, or sleeping (eyes shut), grumpy
(~.~)	sleepy
(-_-;) or (^.^) or (^.^);: or ^.^"	nervousness, or sweatdrop (embarrassed; semicolon can be repeated)

Figure 7. Examples of East Asian Emoticons
(From <http://en.wikipedia.org/wiki/Emoticon>)

East Asian languages often use a double byte character code system and this allows more variety of emoticons in these languages. The next example of Figure 8 shows some Japanese double byte code emoticons showing the emotion of “fear.” Note that emoticons showing an acute emotional state are normally accompanied by actual linguistic expressions or interjections. Japanese characters shown in Figure 8 are all these symbolic interjections representing the feelings of “fear,” with the grey part showing verbal interjections or onomatopoeia showing the fear. Various Japanese writings in kana (phonographic writing) all represent some kind of the feelings of fear.

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(°~°) コワイヨコワイヨ
(((p (>o<) q))) ギャアアア!!!
/(・_・\ コワイヨー
~m( --)m(/;° ロ° )/ アレー
ギャアアア (>< ;)//
(*ノ・)ノギャー——!!
バタバタ ヽヽ(≥▽≤) // キャー
(° ロ° )ヤメテー
\(><)シ ギよえええつ
..・ヾ(。><)シ ギよえええ
\(>◇<)/ギャー!
\(>o<)/ギャーッ!
(((p (>v<) q)))!!
(((p(>o<)q))) いやあああ
ウギャー— (((/ * 0 * ;)/
\ (○_○) /コワイヨー

```

Figure 8. Examples of Japanese double byte code emoticons showing “fear”

(From <http://www.kaomoji.com/kao/text/kowagaru.htm>)

2.4. Emoji as a Linguistic Unit

When we access the Web-based free e-mail service of famous portal sites, we notice that graphic emoticons or emoji are also becoming quite popular in today’s cyberspace. Even when we input the ASCII-based typographic emoticons, some software such as Microsoft Word or e-mail client software automatically converts it into an emoji. In Japan, mobile phones also need a special kind of Japanese input system similar to the computer-based input system and they normally support the input of emoji. All the major Japanese providers are moving toward the standardization of the codes for emoji and the use of emoji is now prevailing in mobile phone communication among young people in Japan.

Emoji input is even easier for non-Japanese people today. The latest versions of iOS, OS X and Windows 10 are equipped with emoji input system and people all over the world can now input emoji in a much easier way. In addition, the fact that a certain “emoji” won the Oxford Dictionaries Word of the Year 2015 shows that emoji is now recognized as a member of the English vocabulary. Figure 9 shows a screenshot of a selection table for “food and

drinks” on iPhone6 when the author tried to use it for a twitter post. Even Westerners will be able to enter these emoji quite easily, if they use today’s iPhone or other smartphones.



Figure 9. Input menu for emoji (all in color in actual display) for iPhone6

2.4.1. New Wave of Emoji Usage of the Young Japanese People

As was also illustrated in detail in Azuma (2012), today’s young people, especially girls in Japan, have a tendency to use emoji together with a relevant word in a sentence. There often exists dual coding, *i.e.*, a word and an emoji representing the meaning of the word placed side by side. Here are some examples taken from actual blog postings of university students:

(C▽^人)!! 晩ご飯!! (C▽^人)φ(c・ω・)ψ モグモグ

Meaning in English: “(C▽^人)!!dinner !!(C▽^人)φ(c・ω・)ψ eating...”

お手紙を発見📧💌うれしい💖

Meaning in English: “ Found a letter 📧💌and felt very glad. 💖 ”

午前5時に起床🌞地下鉄の始発に乗り三ノ宮へ🚶

Meaning in English: “Got up at 5 🌞 and went to Sannomiya by subway. 🚶”

As we can see from these examples, young people in Japan use emoji not only at the end of a sentence but within a sentence to emphasize or just to decorate a word.

2.4.2. Replacement of Word by Emoji

The most recent trend of using emoji is really extreme and some young people in Japan omit a word and use only an emoji illustrating the meaning of the word. Some examples, taken from Azuma (2012), are shown below:

…その後突然📱がぶっ壊れました(;_;)

Meaning in English: “...afterwards, suddenly 📱broke down. (:_;)” (📱= mobile phone)

バイトと🚗教習で大変でした🙄

Meaning in English: “Was busy because of the part-time job and the 🚗 training. 🙄”
(🚗=automobile)

わたし決してこの📷をバックにしては🎄掲らん🙅🏻

Meaning in English: “I will never take a 📷 with this 🎄 behind me! 🙅🏻”
(📷=photo, 🎄=Christmas tree)

These examples are really extreme and of course there are not so many people in Japan who always adopt this style of writing for postings for social networking services or email communication. In addition, many conservative adults, especially educators consider this type of writing to be quite childish and absurd. However, in some sense, this tendency of using emoji as replacement of words might lead to a completely innovative future style of communication.

2.5. Descriptive Study of Emoji

To investigate how frequently the new styles of emoji, i.e., emphatic or dual coding use and ideographic use, are employed, actual blog articles were analyzed. All the emoticons that appeared in blog postings of *AS* and *AM* (the initials of two female college seniors) from August until October, 2007 in Rakuten Blog, one of the largest free blog hosting sites in Japan, were analyzed and categorized into four types; paralinguistic use in an emoji, such as “my stomach can’t wait 🤢”, paralinguistic use in a traditional ASCII-based emoticon,

emphatic use (dual coding, such as “❄️🏰Ski resorts open ”) and ideographic use (example: “🏠👨👩👧👦👶👶👶👶👶👶👶👶👶👶👶👶”). The results of the analysis are shown in Figure 10 and Figure 11, where the actual number of tokens and the percentage of each usage category is shown. As the figures show, paralinguistic use of emoticons was dominant, and we can also see a substantial amount of character-based or ASCII-based emoticons of paralinguistic use (20% in AS’s postings and 11% in AM’s postings).

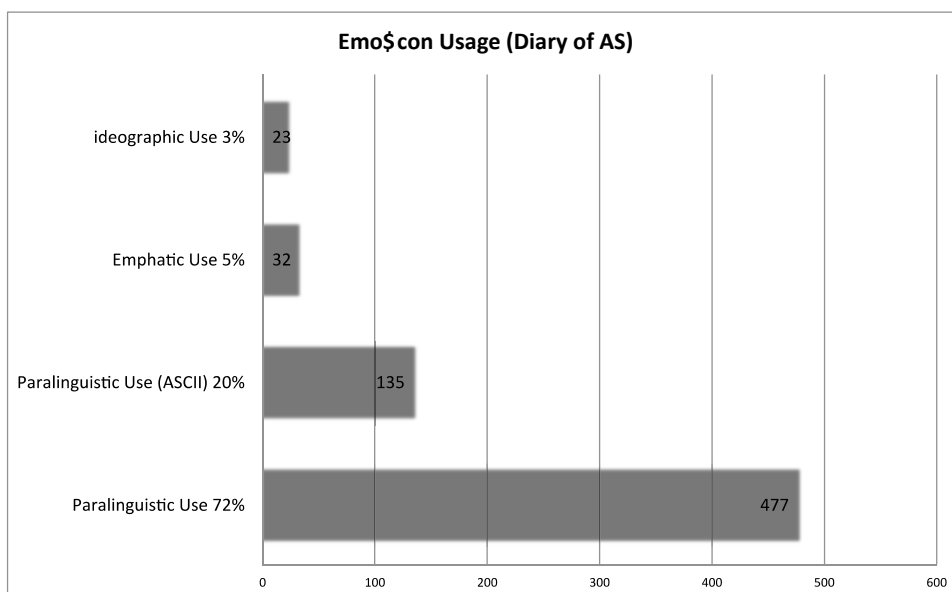


Figure 10. Results of analysis of emoticon use (diary of AS)

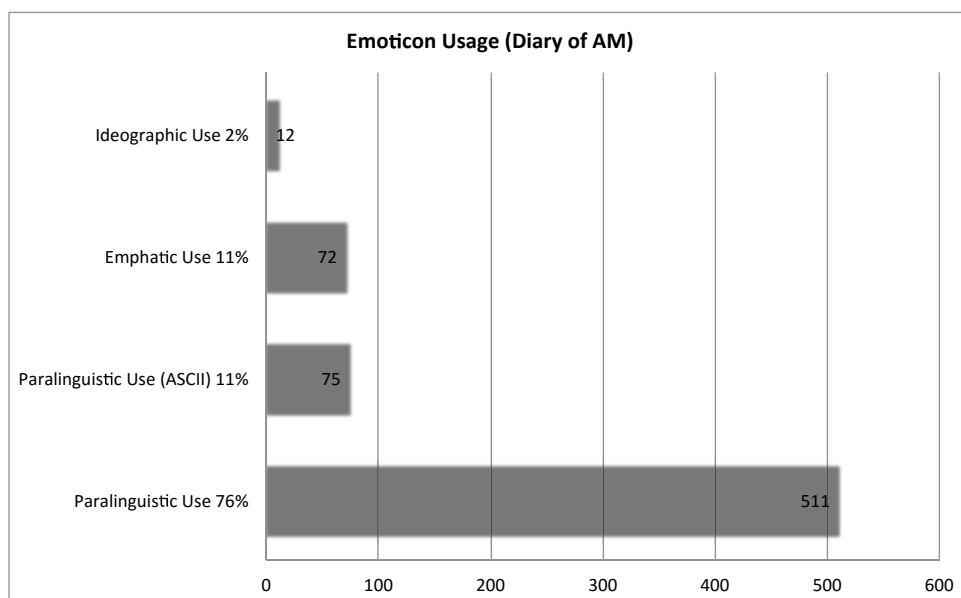


Figure 11. Results of analysis of emoticon use (diary of AM)

The proportion of the new usage of emoji (emphatic and ideographic) is about 10% in both cases, though there are individual differences and preferences concerning the type of usage, whether emphatic or ideographic. For example, AM strongly preferred emphatic use of emoji to ideographic use (11% and 2%, respectively). As was expected, no character-based emoticons were found that were used in an emphatic or ideographic context. The author is also analyzing the recent twitter postings (September of 2015) of young Japanese people and by now, a similar tendency has been observed as far as the usage of emoji is concerned.

3. Power of Emoji in International Communication Settings

If an emoji works as a lexical item, it is considered to be functioning as an ideographic word, like a Chinese character. And if the meaning of the emoji is very easy to intuitively recognize among people who speak different languages, emoji can in a sense behave as lexical items of a primitive universal symbolic language. An international experiment was conducted in order to test this hypothesis, using a small number of Japanese university students at the University of Marketing and Distribution Sciences in Kobe (14 in total) and Austrian university students and young researchers at Graz University of Technology (9 in all).

As is also described in Azuma and Ebner (2008) and Azuma (2012), a special community blog site compatible with emoji was opened at Graz University of Technology under the name of “LearnLand” (URL = <https://tugll.tugraz.at/emotions/> [now closed]) and everyone was instructed to use as many emoji as possible in the postings, where the common language to be used was set to English. In a sense, participants were told basically to use emoji and write in English when they could not properly express their intention in emoji. The assumptions of this project were as follows:

- 1) Even in an international context where the native language of the participants is not English, simple communication will be feasible with the help of emoji.
- 2) Participants in the experiment will have no difficulties in inventing ways to use emoji as lexical items. This will cause a dramatic increase in the ideographic use of emoji in blogs.

Communication for the period of October 11 to November 26, 2007 - i.e., all postings including comments on main postings - was analyzed. The communication seemed quite active, though the content of the communication was not so serious and perhaps even

shallow in nature, partly because the variety of emoticons available was limited. However, it can be concluded that the first assumption of the project was verified. However, it should be also noted that communication problems sometimes occurred. A good example is “how is ☺ in 🇯🇵? in graz only 🇯🇵.” In this context the Austrian member thought it would be appropriate to use a emoji of a mountain (like Mt. Fuji) to show the meaning of *Japan*, but Japanese participants did not understand the meaning.

One more example of communication difficulty is “A weekend full of 📝📞📞”. Japanese participants did not understand the intended meaning of this posting from an Austrian member at all, but as the writer here is a young Austrian researcher who has to write a lot of academic papers and proposals, Japanese participants later understood that it meant *A weekend full of paper writing, with the deadline drawing near and a lot of business telephone calls*.

All the writings in these community blog pages were also analyzed and all the emoticons used here were categorized into four types again: 1) paralinguistic use in emoji, 2) ASCII character-based paralinguistic use, 3) emphatic or dual coding use and 4) ideographic use. The results of the analysis (see Figure 12) show that the ideographic use of emoji prevailed (477 cases, 56%) throughout all communications. Since participants were only instructed to use as many emoji as possible, and not told how to use the emoji, it seems they did indeed learn by themselves how to use emoji as ideographic lexical items. On this basis, it was concluded that the second assumption of the research project was also verified.

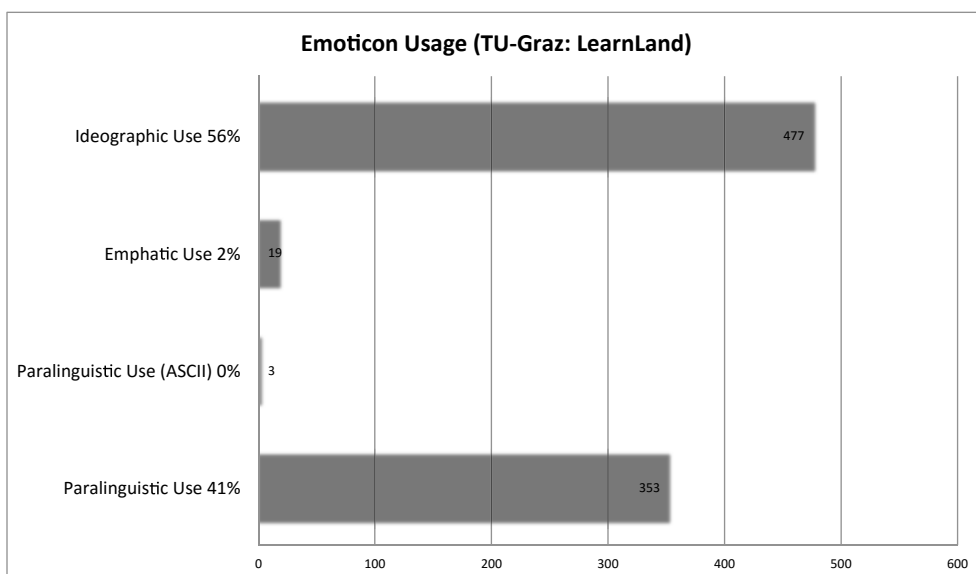


Figure 12. Emoticon use at TU Graz LearnLand community

4. Conclusion: Is a New Age of Picture-centered Communication Starting?

As human beings evolved and came to produce so many convenient tools and machines including computers and intelligent mobile devices that assist our thinking, analysis and communication, the amount of our daily communication has dramatically increased. We have to deal with a lot of complicated and varied information today. In this context, even ordinary businesspeople have to carry a laptop or a tablet computer to analyze the business data and communicate with their colleagues and business partners online. Presentation without these intelligent gadgets is becoming more and more difficult.

Microsoft PowerPoint or Apple Keynotes are the two strong presentation aids for our business communication. Even with these presentation applications, however, it is becoming more and more difficult for us to manage our everyday presentations. One problem is we cannot show so many words and sentences in our slides even though there is so much content we would like to offer. It is true, as some gurus of slide presentation, such as Duarte (2008) and Reynolds (2011) suggest, a slide full of words and sentences in small fonts is quite difficult for the audience to understand. In addition, these gurus insist that we should use more pictures and graphs with effective color balance instead of full linguistic explanations.

One significant buzzword in the area of presentation method is infographics. Infographics is short for “information graphic” and its definition by Smiciklas (2013) is “a type of picture that blends data with design, helping individuals and organizations concisely communicate messages to their audience.” Krum (2014) goes further and defines infographics as “a larger graphic design that combines data visualizations, illustrations, text, and images together into a format that tells a complete story” suggesting that the core message to be conveyed should not be just data but a bundle of rich visual sources and text. Today we have even a book like “The Infographic History of the World” by D’Efilippo and Ball (2013) though it is not completely clear if the authors really succeeded in describing the world history in infographics. Although, most of the books of infographics do not mention the connection between the idea of infographics and ISOTYPE, it seems quite clear that the idea of today’s infographics owes much to that of ISOTYPE, a special kind of pictogram system for effective communication of complex information, coined and advocated by Otto Neurath (Neurath, 2010) .

Our communication history tells us that the communication through visual signs and symbols gradually evolved into some forms of written language. These primitive written languages, as they originated from the combination of picture-like signs, should have been

ideographic at first. These primitive languages, however, became more complicated and acquired a sophisticated structure as spoken languages became more and more important. In order for the developing spoken languages to be able to transmit a complex message with logical structures in spite of the restriction of the physical nature of the sound, these languages inevitably developed into a multi-layered structure where some sound units are combined to form a higher-order unit and a collection of the higher-order units form a sentence, paragraph, *etc.* However, today's information-rich society makes this linearly structured spoken language system more and more difficult to use. Even if we use the written language format, this highly developed multi-layered structure, which should be read and interpreted linearly, might hinder the quick and efficient communication of information-rich contents. The idea of infographics emerged just when some people found that the conventional character-based communication might not be able to manage the interchange of ideas in today's information-rich society. Whether we like it or not, we may have to plunge into another age of picture-centered communication, which will be quite different from the days of the conventional character-based communication and compatible with the information-rich society of the near future with big data. Technological development and the communication infrastructure will make this drastic change possible soon. The popularity of emoji might be just a prologue to this new age of rich picture-centered communication.

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