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Science Comic Strips

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Abstract

Science comic strips entitled Dr. Scifun were planned to promote science jobs and studies among professionals (scientists, graduate and undergraduate students) and children. To this end, the authors collected intriguing science stories as the basis of scenarios, and drew four-cut comic strips, first on paper and subsequently as computer files. Eighty three episodes of the cartoons in English are available on the homepage (anatomy.co.kr). The comics have been displayed in the on-line science magazine and the science museum in Korea. The reception has been positive. The comic strips help inform graduate students and young scientists of the appropriate philosophy for their devotion to science. As well the comics demonstrate the fascinating and meaningful activities of scientists to juveniles. It is anticipated that competition between comics created by different scientists will improve the quality of the publications, benefiting readers worldwide.

Keywords: humor, cartoons, science, research, education, Internet

1. Introduction

The corresponding author of this article graduated medical school in Korea. He did not become a clinician, but became a teaching and researching anatomist. As a sideline, he has drawn a series of anatomy comic strips, with the goal of facilitating the effective communication of difficult subject (Green & Mayer, 2010). His anatomy comics were designed to help medical students learn the complexities of anatomy in a straightforward and humorous way. Every episode of the comic strips, entitled “Dr. Anatophil”, was composed of four cuts (Park et al., 2011).

Anatomy is a kind of science, so it was taken into account to expand the scope of comics into science. Initially, the author, who had no exposure or experience with various fields of science, was afraid of drawing science comics. In the same way, no scientists were qualified to illustrate them. For example, it is unlikely that a physicist would have the necessary knowledge of other disciplines such as anatomy. A genius like Leonardo da Vinci is not considered. So the author dared to create comics, thinking “Why don’t I go early if everybody’s not eligible?”

The anatomy comics deal with profound knowledge for teaching medical students (Park et al., 2011). Corresponding trials were educational comics for chemistry (Di Raddo, 2006) and biochemistry (Nagata, 1999). However, in case of a broad science base, the only approach is to adopt a common-sense delivery, which is relevant regardless of research areas.

Without humor, science comic strips would be worthless. Every field of human undertaking has an element of humor that can be exploited to popularize the particular field. Humor can be the basis of attraction that leads to a life-long participation in science.

PhD Comics are well-known cartoons that depict the lifestyle of graduate students in the midst of their scientific researches (PhD Comics, 2011). Lab Bratz, another comic strip, was inspired by the day-to-day activities of a scientific laboratory and office space (Tatalovic, 2009; Lab Bratz, 2011). Our science comic strips are different,

in that the strips are from the viewpoint of a professor. The varying sorts of science comics, equipped with their own philosophies, would widen choices of readers, so that the author didn't hesitate to generate the cartoons.

Purpose of the science comic strips in this trial is to encourage other scientists, graduate and undergraduate students, even children performing their scientific activities and learning. For fulfilling the aim, it has been tried to collect the interesting science stories and to draw comics delivering the funny tales efficiently.

2. Methods

Dr. Scifun was made almost identically to preceding anatomy comic strips (Park et al., 2011). The science comic strips also featured the corresponding author with the indistinguishable character. However, his nickname was changed from Dr. Anatophil to Dr. Scifun (Figure 1). Scifun, a compound word encompassing science and fun, was the homonym of siphon, a scientific term. Like the siphon draws and conveys water, Dr. Scifun was expected to draw and convey scientific humor and message. The procedures to create science comics were as follows.

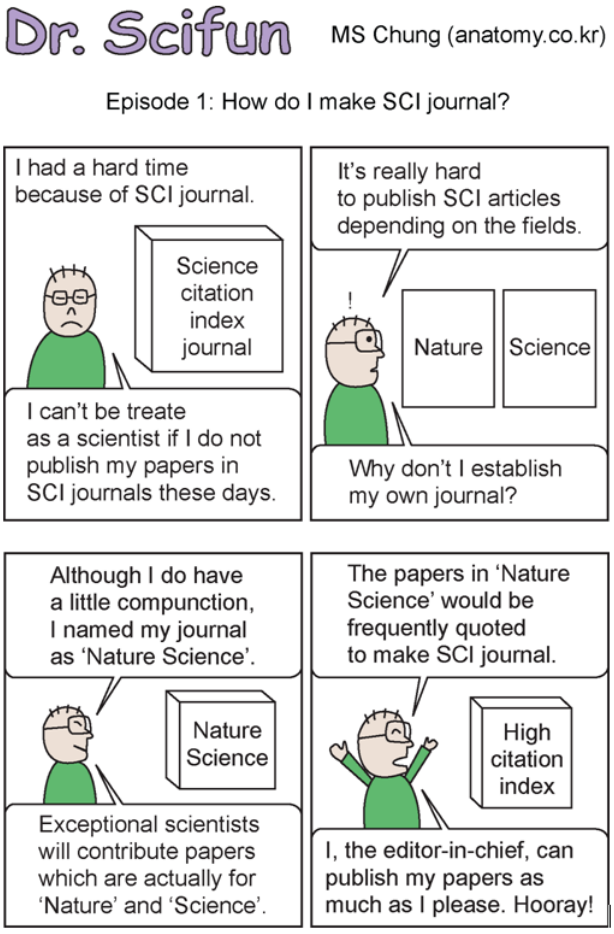

Figure 1. Feature of one episode of the science comic strips

Title "Dr. Scifun" is followed by subtitle, four frames of cartoons, and the author's remark

2.1 Acquisition of Stories

Initially, funny stories associated with science were gathered by reading books, conversations with others, watching the television, or searching the Internet. Recording the idea was essential.

2.2 Writing of Scenarios

Stories were put down as they happened to Dr. Scifun, who was a funny scientist and professor. The supporting characters were Dr. Scifun's unnamed graduate students, acquainted researchers, friends, and family members. The scenarios required dramatic composition such as logic, expectation followed by satisfaction, and pleasant reversal.

The narrative text of each comic strip was written in four paragraphs, matching the final frame count. One more paragraph was the author's compensatory comment introducing background of the episode (Figure 1).

2.3 Drawing of Comics on Paper

The text of each scenario was illustrated with pencil and paper. The stationery was chosen so that the scenario could be simply altered during illustration. In other words, the writing and sketching were a fluid process that influenced each other.

2.4 Drawing of Comics on Computer

The paper version of each comic strip was digitized using graphic software. Among the several accessible software packages available for this purpose, Adobe Illustrator CS5 (Adobe Systems, San Jose, CA, USA) was selected because vector lines could be easily modified using anchor points; the lines were conveniently filled with colors. It was possible that the lines were duplicated in other cuts for reducing repetitive work. Furthermore, texts from the scenario in a word processor format could be copied onto the Adobe Illustrator (Hwang et al., 2005). The computer drawing was performed by part-time workers. Even with a changing staff, it was possible to maintain consistency of pictures (Figure 2-4).

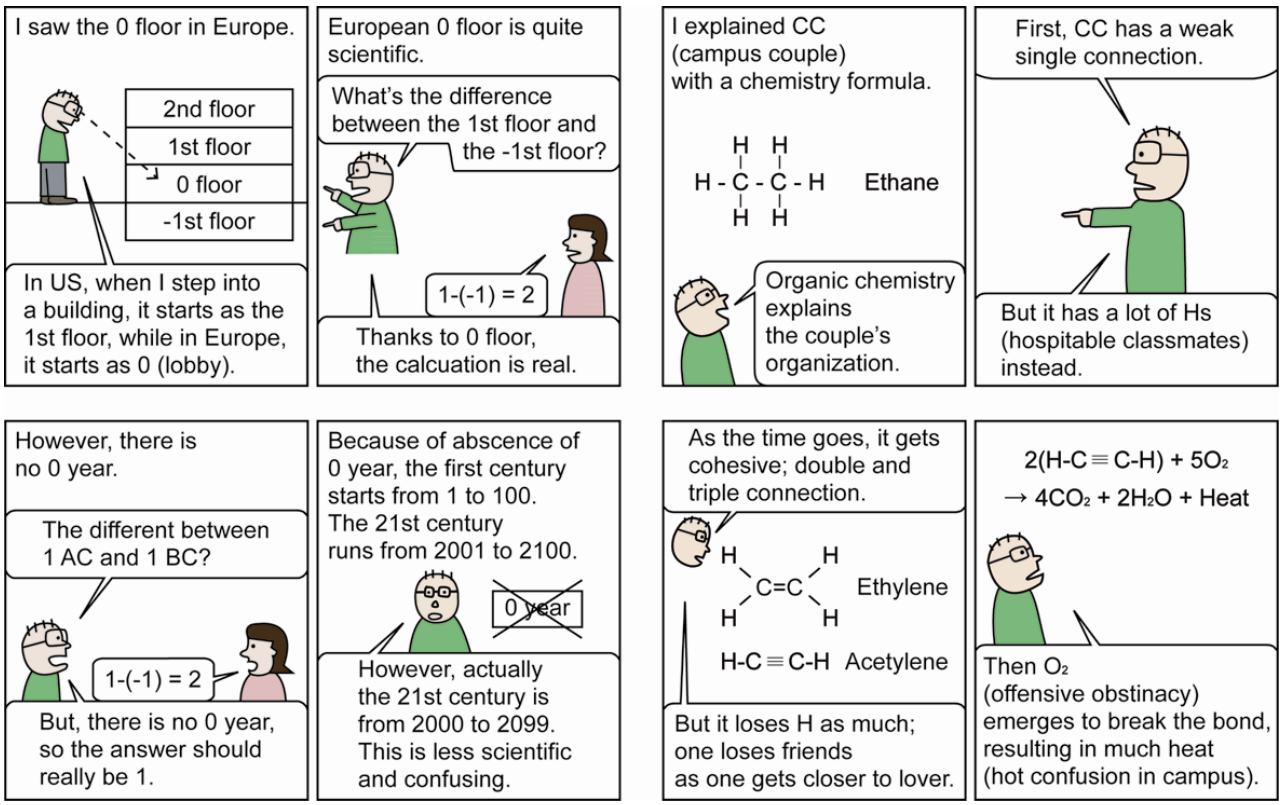

Figure 2. Comic strips dealing with scientific humor

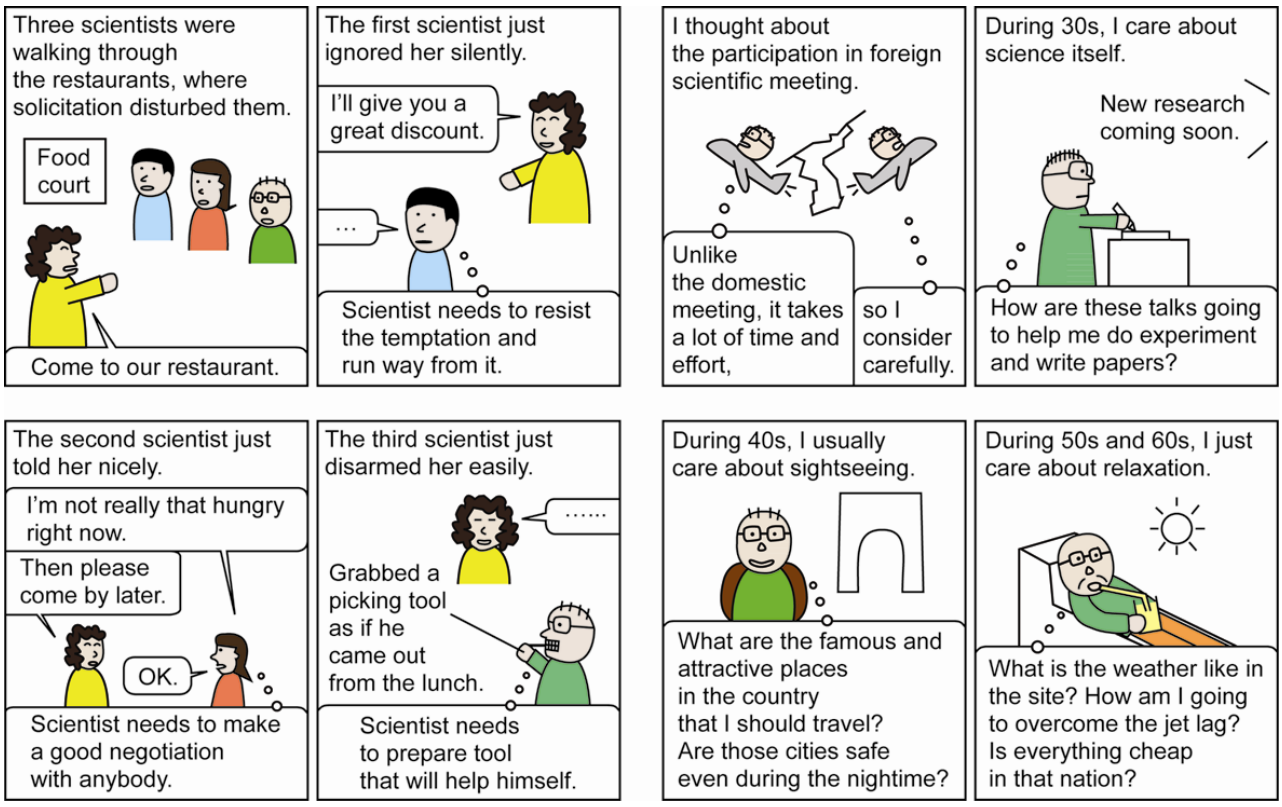

Figure 3. Comic strips showing the interesting lives of scientists

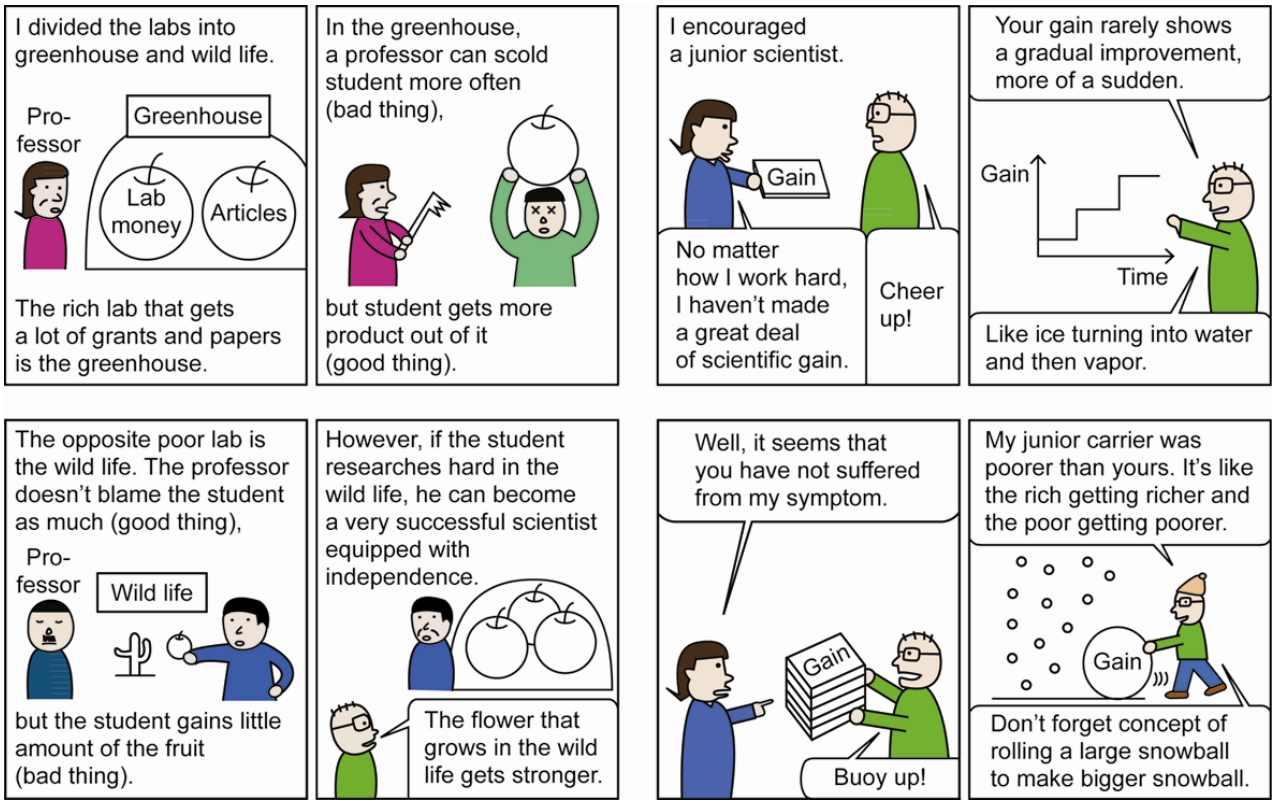

Figure 4. Comic strips encouraging graduate students and junior scientists

2.5 Distribution of Comics

Each episode was converted into a BMP (bitmap) file with high resolution (300 dpi) (Figs. 2-4). The BMP files and the supplementary text files of author's comments were uploaded on the homepage (anatomy.co.kr) (Figure 1).

Prior to production of an English version of the comics, a Korean version was introduced in the on-line popular science magazine (Science On, 2012). Since February, 2010, the comic strips have been uploaded serially every week (Figure 5).

Figure 5. Comic strips uploaded in the Korean science magazine (left) and those on display in the science museum (right)

The comic strips were exhibited in the Gwacheon National Science Museum, the largest Korean one close to the capital city, Seoul. The Korean and English versions were used for domestic and foreign visitors, respectively (Figure 5).

3. Results

Science comics demand a novel idea and time for development and execution. In our experience, after hatching a story for one episode, the actual manufacture of the strip spent 9 hours: 3 hours for writing, 3 hours for sketching on paper, and another 3 hours for the computer drawing. In fact, decades of episodes were simultaneously processed as a mass production. Eighty-three episodes can now be viewed at the website. No payment or registration is required.

In the on-line science magazine, the comic strips have been the most popular corner. Korean readers' replies on the bulletin board of homepage have generally been favorable (Science On, 2012). The visitors to the science museum did not miss the exhibition of comic strips. Most of them laughed irrespective of ages, which seemed a positive response (Figure 5).

4. Discussion

Science and comics share similarities - both require an idea that is unique and creative. Of course, other fields such as the literature and painting also necessitate uniqueness and creativity. But, just science and comics can be objectively evaluated by the public. Science and comics in the same nature constitute a harmonious combination.

Comics have an enormous capacity to relate science stories and convey scientists' message to the audience (McCloud, 1993). This was exemplified in the study to build a science curriculum that incorporated comic strips and provided students with opportunities to read, discuss, and respond to the contents of these comics. The comic strips stimulated students' interest in science issues and promoted science literacy (Olson, 2008). In another study, children exposed to science comics were able to give scientific explanations for the comics based on their own experiences (Weitkamp & Burnet, 2007). Spurred by curiosity from science comics in yet another study, children were motivated to look for more information in magazines, newspapers, the Internet, and other sources (Rota & Izquierdo, 2003). Posters that involve science-themed comics enhanced the public's understanding of science across multiple generations (Naylor & Keogh, 1999).

While the above is encouraging, we have noted a deficit of current science comics: most cartoonists who write and sketch the comics do not have formal science training or actual experience as scientists. Veteran scientists are likely to describe scientific jokes and scientists' lives more specifically and persuasively. The scientists'

writing may be translated to images by professional cartoonists. But, the process of translating scripts is also crucial, as artists can distort writers' visions (Tatalovic, 2009). It is, therefore, desirable that a scientist simultaneously note and illustrate the comics.

The available commercial comics are usually aimed at children's curiosity. Dissimilarly, the author has wanted to mainly satisfy grownup readers rather than juveniles. Cultivated adults prefer logical jokes based on the scientific contents. For example, the jokes in the comics could pleasantly explain how science is related to daily life (Figure 2).

High schools students can be reluctant to specialize in science because of the preconception that living as a scientist is boring and exhausting. Science comic strips could be a novel tool to demonstrate the intriguing and worthwhile activities of scientists. For example, the authors often dwell on negative traits of Dr. Scifun, such as vulgarity, which could be a human touch of a scientist (Figure 3).

We intended the comic to encourage young researchers like graduate students, whose enthusiasm and dedication to their science craft can wane. In this light, the comic strips comprising lessons of the experienced person could be a source of renewal and re-devotion. Furthermore, the comic could influence their creativity by providing perspectives from other fields in science as well as empathic, observational, and communication skills of scientists (Figure 4) (Green & Myers, 2010).

The job of writing and drawing a comic is more understandable by comparison with production of a theatrical movie. Acquisition and composition of stories to create a scenario are almost the same for both a comic and a movie. The comic is then drawn on paper, which is similar to continuity work with still scenes for film. In other words, preliminary jobs prior to comic drawing on computer are not so different from those before filming. The final job, computer illustrating of comic, does not require a significant effort, in contrast to the major process of shooting with actors and actresses, followed by editing.

We hope that other scientists will draw comics and distribute them freely through the Internet as we do. The competition between science comics including PhD Comics (PhD Comics, 2011) would improve their own levels, which will benefit all readers. Even scientists without drawing talent are capable of cartoon production through help from computer graphic software. That is why we have detailed our illustration methods in this publication. Referring to the author's technique, others can develop their own unique methods.

The creation and educational use of comic strips are ongoing to account for the science and scientist's life with related humor. Another 80 episodes in English will be presented around the close of 2012. The authors will improve the comic medium in the science museum to enhance the scientific interest of the visitors. There is the possibility that science comic strips are converted either into versions for different equipments (e.g., smartphone) or into a variety of animations (e.g., flash animation).

There seems to be numerous persons who read the Dr. Scifun in the homepage and the science museum. The on-line and off-line readers' opinions will be surveyed in a subsequent investigation. An objective assessment of how the science comics are perceived by reading public and to what degree they aid diverse students and other scientists is planned. Evaluative narrative comments from viewers in different countries would also be worthwhile.

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