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"Future Sound": Analysis of Digital Tools from the Vocaloid and Hatsune Miku Fan Communities

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Anthropology

Abstract

The singing synthesis software, Vocaloid, along with one of its most popular voice libraries, Hatsune Miku, has gained an Internet fan base thanks to an infrastructure of already-existing websites and the concept of "remix culture," which permits working off of others' ideas and assets to make new creations. In this paper, I examine some of the critical aspects and ideas of the Vocaloid fandom through key readings and articles. These readings reveal that the popularity of Vocaloid is due to both this remix culture and Hatsune Miku's depiction by her creators and fans. I also discuss some key points concerning the fan base's relationship to technology. Finally, I propose ideas on what future research in this area might choose to focus.

This paper discusses the Vocaloid software, one of its most popular voice libraries, Hatsune Miku, and the fan base that has emerged primarily on the Internet focusing on both. Vocaloid, often stylized as VOCALOID, is a singing synthesis software that was initially developed as part of Jordi Bosada's dissertation project at the Pompeu Fabra University in Spain, with funding from the company Yamaha, who also owns the rights to the program. Initially released in 2004, the software was one of the first commercially sold singing synthesizers, the development of which had previously been confined to university research. While, Yamaha is responsible for the development and maintenance of the software, they do not publish the voices. Instead, Yamaha licenses development tools to third-parties, who then "create a database (called a singer library) consisting of phonemes voiced by an organic body and then release that voice with a score editing version of the software that allows the user to write music that is sung by the synthesized voice" (Bell 223). Much like other musical software such as FL Studio and GarageBand, Vocaloid's editor software uses a piano-roll interface (**Figure 1**).

This software ignited a large fandom focused on the creation, dissemination, and enjoyment of creative works that use the software after Crypton Future Media, a Japanese music software distributor, decided to create anime-style avatars for their voice libraries, a strategy which has since been imitated by many other companies. These avatars are essentially "bodies" for the synthesized vocalists. Additionally, Crypton markets their libraries as "character vocals," a tactic that came about due to the fact that professional

singers refused to provide their voices for the software. Crypton, instead, asked voice actors, resulting in their libraries having distinct vocals that evoke the feeling of coming from a “character” (Crypton Future Media). By far the most popular of Crypton’s avatars is Hatsune Miku, who is depicted as a teenage girl with the distinctive characteristic

Fig. 1 Screenshot of the interface of the newest Vocaloid engine (Crypton Future Media 2017)

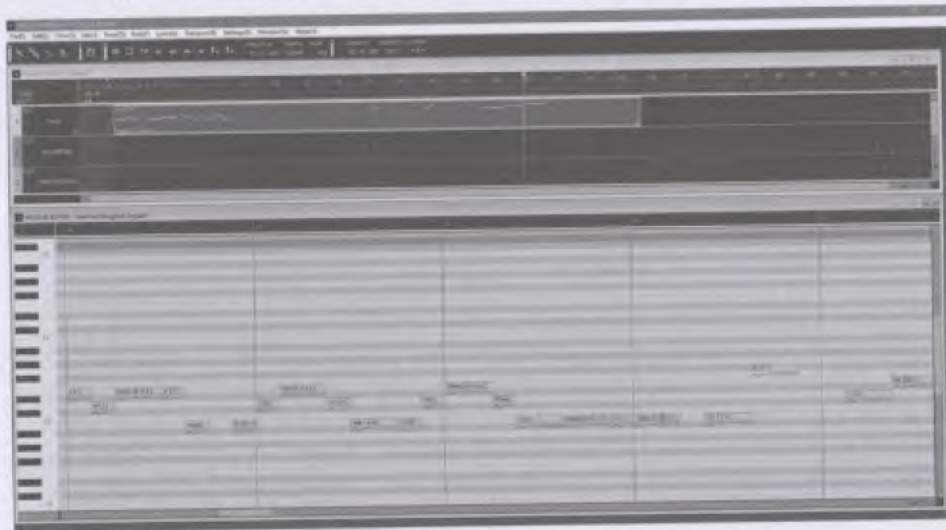
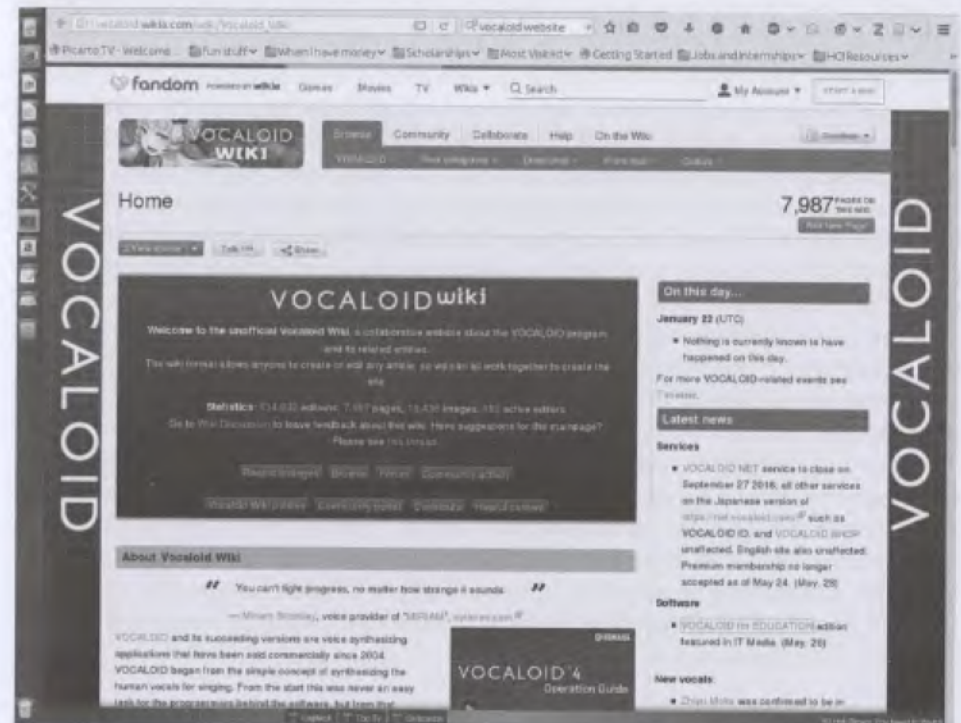


Fig. 2: Box art for Hatsune Miku, one of the most popular Vocaloid voice libraries. (Crypton Future Media 2017)



of long, turquoise-colored hair worn in pigtails (Figure 2) Since Crypton chose not to enforce intellectual property when it came to the use of Miku’s image, creators can use it however they wish, which spawned a rich fan culture (Bell 224). This fan culture, in turn, was helped along by a rich infrastructure that depends on the use of information and communication technologies (ICTs). Much of this infrastructure consists of already-existing web sites that fans found to be useful for their activities, such as sites focused on posting artwork and videos. A few of these websites include Pixiv, YouTube, DeviantArt, and Nico Nico Douga. Additionally, the fandom has also created new websites that specifically focus on Vocaloid, including VocaDB, an online database for cataloging

Fig. 3: The front page of VocaloidWiki, a knowledge base containing information about the Vocaloid software itself, Vocaloid character avatars, and producers who utilize the software in their work (Crypton Future Media 2017).



Vocaloid-related songs, albums, and producers, VocaloidWiki (Figure 3), which acts as a knowledge base, and VocaloidOtaku, which is a fan forum. These and other sites allow fans to connect with one another, keep up to date on the latest Vocaloid-related news, and to consume the latest notable fan works that have been created.

Fan activities thus allowed Miku’s star to rise, culminating in concerts featuring a holographic depiction of Miku and fan created songs performed by a live band. In short, Miku is a virtual idol who has been buoyed by her fandom via their creations. Hatsune Miku’s depiction, Vocaloid, and the accompanying fandom are all rich subjects for study due to the many themes present, including those of gender, collaboration, and community. The following will first examine a selection of articles; some directly discuss the Vocaloid

fandom and Hatsune Miku, while others explore relevant issues and themes, including collaboration, community, and virtual bodies. I will then discuss a few topics and concerns for future study, such as the community infrastructure being used as a source of knowledge for users of the Vocaloid software, and the uneasy relationship between the Vocaloid community and piracy.

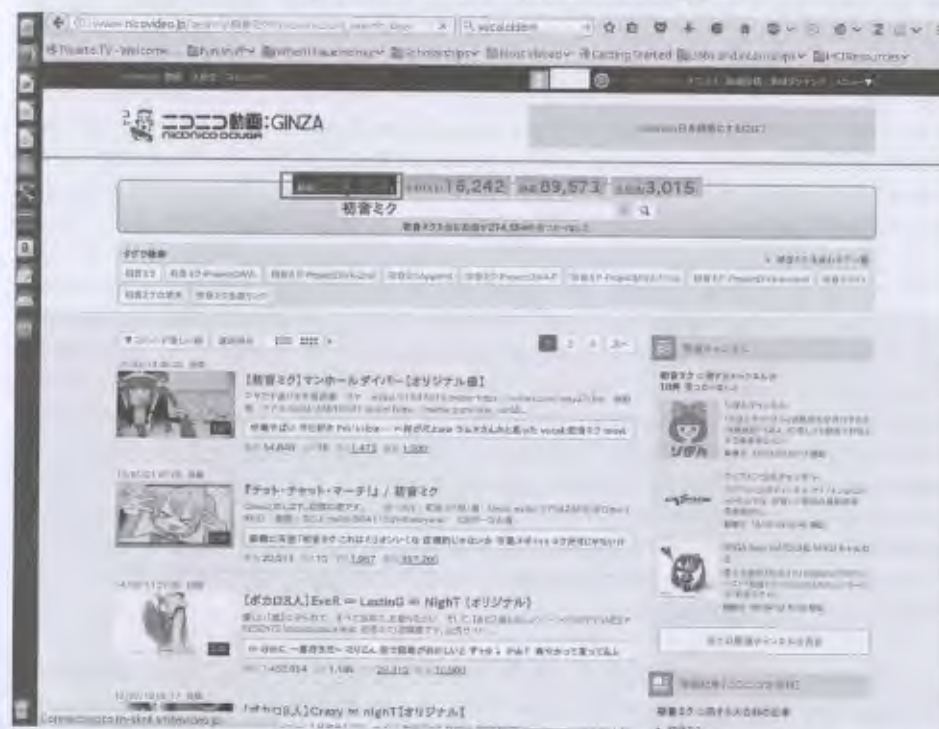
At the moment, there is a wealth of literature concerning not only the sociocultural aspects of Vocaloid and Hatsune Miku, but also a large amount of literature exploring related themes, including the exploration of online communities and the aesthetics and appeal of virtual idols. The available literature analyzes the culture of remix, collaboration, and sharing prevalent in the Vocaloid fandom, as well as the sociocultural meanings and implications of Vocaloid avatars themselves, mainly Hatsune Miku.

Sarah Bell's article, "The dB in the .db: Vocaloid Software as Posthuman Instrument," provides some framework in describing and analyzing the social, cultural, and technical aspects of Vocaloid, and the fanbase that surrounds both it and Hatsune Miku. Bell states in the introduction that, "[t]he synthesis of the singing voice is a watershed event in our evolving sociocultural relationship with what it means to be human" (223). In other words, the substitution of a human singing voice with a synthesized voice blurs the definition of both what it means to be a human and what it means to be a machine from the perspective of the listening audience. The existence and use of Vocaloid shows how, in an era of "technologization of the human body," there are many contexts of the instrument of "voice" beyond just the unaltered human voice. In addition, the ability that one has to manipulate synthesized voices ties into challenging the essentialism of cultural identity and gender; more particularly, it challenges the notion that a certain timbre of the voice is necessarily tied to particular bodies. Furthermore, Vocaloid voices can be manipulated "to a point at which pitch and timbre are not reflections of gender, but function outside of biological 'male' and 'female.' In other words, the use of Vocaloid allows for gender to be fluid rather than a binary, or an 'essential identity'" (232). It is in this way and others that the use of Vocaloid, as opposed to a human voice for music, has some advantage in regards to depicting identity. This, combined with the remix culture inherent to the Vocaloid fandom, means that Vocaloid, as an instrument, creates a powerful extended agency to foster creativity.

It is because of this aforementioned manipulability possible with the software that, "the creation of...Hatsune Miku, ignited an entire fandom circulating around Vocaloid music production by amateurs" (224). Since Crypton did not put restrictions on the use of her image, artists, animators, and musicians have free rein in the use of her character for their artistic creations. The result was "thousands and thousands of fan-generated works that incorporate Miku's image, many of them animated music videos of original songs written by end-users of the software" (224). **Figure 4** shows a screenshot of search results for Hatsune Miku on the popular Japanese video site Nico Nico Douga. The search results shown here consist of videos for original songs created using Hatsune Miku's voice library; the bottom two video thumbnails depict the Miku avatar, as well. In addition, one should pay attention to the fact that there are over 200,000 video results, which I have outlined in red near the top-left corner. This large number of results illustrates the amount of works that have been created using Miku's voice library.

Ken McLeod's article, "Living in the Immaterial World: Holograms and Spirituality in Recent Popular Music," discusses and explores the connections between the use of holograms in live music performances and spirituality. On the subject of live Miku concerts that are performed using a holographic image of the virtual idol on stage, McLeod says that the concerts are an end result of the "open source ethos" that is particular to the Vocaloid fandom (505). All of the creative material involving Miku has been created by the fans. The concerts that feature this fan written music demonstrate the "secondary creativity," or "niji sosaku," of the community, which is defined by Lam as its ability to

Fig. 4: Screen shot of results of a Nico Nico Douga search for Hatsune Miku showing over 200,000 results. Nico Nico Douga, or NND for short, is a popular video site in Japan.



make creative works partially using others creations (Lam 1108). McLeod argues that holographic performances are a spiritual experience for Vocaloid fans because they are a chance to partake in a transcendental experience that comes from being co-present with their crowdsourced idol, the idol that of which fans in particular have helped to create the mythos and lore. The "unreality" of Miku is very much part of this experience, because she is a blank slate that creators can manipulate freely (McLeod 507).

The "hyper-real" experience offered by Miku concerts is tied into the very nature of Miku's unreality; she is "forever frozen in an idealized form" (McLeod 508). She does not age, and she cannot be subject to any controversy due to her actions (508). The holographic experience is also fostered by humans' increased openness to mediated experiences. For one, the public is already used to music as a hyper-real experience because of the ubiquity of "electronic recording and music reproduction practices over the past

century" (508). Holographic performances are therefore merely "one more extension of the abstraction of the human self" (508). This abstraction is, in turn, yet another aspect of post humanism that questions the nature of what is "real" and what is "virtual." The theory of F. Allen Hanson has some applicability here, especially the notion that "possibilities for action depend not just on human beings" (Hanson 93). Holograms are capable of actions that affect the audience by increasing their immersion of the experience of being in the "presence" of Hatsune Miku in ways that having her represented by a human actor would not, because holograms emphasize Miku's "hyper-reality."

Tim Wall and Andrew Dubber's article, "Experimenting with Fandom, Live Music, and the Internet: Applying Insights from Music Fan Culture to New Media Production," explores music fandom and online engagement by reporting on the results of a study which involved creating a website and blog tied into a jazz festival in the UK. It explores how music fans use online tools for purposes of discovering and discussing music, and, in particular, how fandoms that have traditionally emphasized live performances over recordings have overall embraced online fandom. Most relevant in this article to the overall discussion is the sharing and modularization employed by the online jazz fandom, which also describes the behavior of Vocaloid fans.

Wall and Dubber first explore the activities of online music fandom. They explain how in recent years the online relationship between music fans and music has been problematized, not only because of piracy, but because of the perception of the online experience as being "unreal," "not live", or even "hyper-real". Questions about virtual experiences are often structured within a discourse which builds upon earlier cultural debates about recorded versus live music" (Wall and Dubber 160). In the online jazz fandom in particular, "the online environment in which jazz fandom takes place utilizes technologies formed into an infrastructure" (162). Additionally, there is the use of what Wall and Dubber call "folksonomy," which is the "tagging of items of digital data by individuals in aggregate [that] creates a categorization system that enables others to find your contribution" (161).

This practice is quite prevalent in the Vocaloid fandom; both Nico Nico Douga and YouTube have tagging systems that allow fans to find content more easily; oftentimes, especially on Nico Nico Douga, tags are standardized by the fans. Additionally, this kind of action tends to foster the division of "existing media material for use in fan activity, the creation of original material in similar modular elements, and the assembly of such modules into larger fan artifacts like web pages and blogs" (162). Wall and Dubber then describe their experimentation with online live music, which involved partnering with a jazz festival and creating a website on which to put content from the festival up onto the website, utilizing the tagging and modularization they observed beforehand. They conclude that these practices combined with live music sparked interest among fans, and should be further studied (168). Wall and Dubber's work is an example of the use of the analytical orientation, or, "studies that develop theories about ICTs in institutional and cultural contexts" (Kling 7). Their development of the website is an active method to research how online jazz fans use and adapt ICTs. Additionally, similar research approaches may be useful to employ when studying the Vocaloid fandom.

Ka Yan Lam examines the popularity of the virtual idol Hatsune Miku and the Vocaloid software through postmodernist and feminist lenses. Especially relevant is how the author discusses the secondary creativity culture of making derivative works with Miku's voice and how the infrastructure of Nico Nico Douga has helped to foster this culture. Through this creativity, fans "circulate their own messages and values" (Lam 1109). The avatar itself represents the complex relationship between gender, virtual bodies, and technology: while, technology can be empowering for women, it can serve to reinforce gender stereotypes and the objectification of women. In the case of Hatsune Miku, it does the latter, according to Lam. The author concludes that Miku reflects gender issues and social constraints in Japan (1118-20).

Fig. 5: A screenshot of YouTube showing works derived from a popular song using Hatsune Miku's voice and image, *Noushou Sakuretsu Girl*. Visible derivative works include several different covers of the original song.



Lam's discussion of the Vocaloid phenomenon reveals some interesting things about the infrastructure that the fandom uses. More particularly, Lam discusses how Nico Nico Douga allows users to upload their video "as a response to another one...[t]hose who are fond of the music can record themselves singing the lyrics, overlay commentaries on the videos, and rank their favorites" (1108). This feature of the Vocaloid fandom's infrastructure further fosters the existing remix culture of the fandom by encouraging others to respond to and conceptualize others' creations. Figure 5 depicts this remix culture in action through YouTube search results for the song, *Noushou Sakuretsu Girl*, by the producer Rerulili. Visible are thumbnails to videos that are mostly covers of the song; from top to bottom are a band cover, a piano cover, a vocal cover, a trailer for a movie adaptation of the song, and a cover using the freeware singing synthesis software UTAU.

According to Lam, "[s]uch creativity fosters not only a highly participatory cyber-culture but also the formation of 'Nth fanfiction' with the 'N' indicating the possibility for infinite fan-made reproductions" (1108). In other words, the derivations of fan creations are potentially endless. Additionally, "Miku's fans advance from video to video, appropriate new materials, and make new meanings in their reproductions. By publishing their creative productions, they circulate their own messages and values. Miku organically grows through the Internet in the sense that the users make their own music, and 'once it's theirs, it's theirs'" (Hutchison 1109). The fandom is thus constantly creating new meanings and personalizing the works of others. This fan activity is similar to the activity of open-source programmers, who have the agency to modify other people's programs in ways they see fit, thanks to the philosophical underpinnings of the community and its emphasis on "free" as in speech (Coleman 164).

Additionally, Lam's analysis of how Miku relates to themes of technology and gender shows that the relationship between the Vocaloid fandom and gender is complex (Lam 1118-20). On one hand, returning to Bell (2016), the software itself can be used to blur the lines of gender boundaries by separating the voice from the body and being able to manipulate its parameters. On the other hand, the avatar of Miku herself is a heavily gendered depiction, similar to the "'pixel vixen': 'computer-generated images of digital women who are young, slim, fair-skinned, wide-eyed, and often scantily clad'" (Lam 1111). Thus, Lam concludes, "Hatsune Miku as a human-form robot-machine is incapable of deconstructing gendered categories. The iconography instead objectifies and commodifies women by associating the synthesizer with a heavily coded image" (1118). This raises an important question: How does the fandom reconcile this heavily gendered, and arguably objectifying, depiction of women with the fluidity to which gender can be depicted using the software itself? The answer could lie in how "those interacting in 'virtual' space are experiencing, imagining, and narrating new boundaries of the human perceptive system and new boundaries of participation" (Keating 528). In other words, fans are able to work with a heavily coded and gendered image because the technology can be used as an agent to redefine these codes and images into something that can subvert or even reject the "default" societal implications of Miku's image.

Black (2008) explores similar themes as Lam, however, he focuses on the cultural meaning behind virtual idols in general, rather than Vocaloid in particular. Virtualizing idols, who are desired for their youthful, innocent qualities, ensures an idol that not only cannot age and lose her (and it is usually a her) youthful charms, but are removed from the biology behind human female bodies, which has been the subject of anxieties in a male-dominated society (Black 38). In addition, virtual idols have much to do with the Western streamlining of technology and the *kawaii* aesthetic, which both also seek to hide inner workings under a clean exterior that does not suggest their existence. Thus, virtual idols are "idealized" and "clean" approximations of female bodies (43-48).

In essence, virtual idols are "computer-generated equivalent[s] of the Japanese *aidoru*, or idol, a media figure which can be taken as an extreme example of corporate attempts to prefabricate celebrity" (Black 37). Idols "serve as fodder for the production of carefully planned and managed performances of innocent high spirits and adorable naivety" (38). Virtual idols were created in part to avert the inevitable realities of an idol: that is, that

they age and lose their appeal. Thus, a virtual idol is one who can never lose their appeal. Black also explores the appeal of the *kawaii* aesthetic, which tends to smooth over certain biological processes of the body; in conjunction with the traditional Japanese emphasis on cleanliness, this can be understood as the aversion of traditional anxieties concerning female bodies (39-41).

Virtual idols are depicted with a "lack of overt sexuality", and possess a factor of being unexceptional. Both of these attributes in turn make them non-threatening to their primarily male, heterosexual audience (Black 41-42). Additionally, while virtual idols try to approximate the appearance of a female body, they also, by virtue of being virtual, avert the previously mentioned anxieties about the female body. Virtual bodies are "an impression of pure exteriority, creating a smooth, unbroken surface which perfectly seals itself over anything which might be fragmented, unsettling, or unsightly" (46). They are thus, "a more extreme manifestation of [a] fascination with the de-biologized woman" (47). Concerning Vocaloid, Black's ideas can be used to explain the appeal of Vocaloid and Hatsune Miku. Mainly, her nonthreatening depiction as a young woman can be tied into what Black describes as the factor of being unremarkable, and the de-biologization fascination ties into why virtual idols are so appealing to their audiences. Returning to Hanson (2009), "de-biologization" can be viewed under a kind of *joint responsibility*, wherein it is not only humans that are responsible for an act, but also any machines used in the process of the act (92). Is de-biologization of the female body the responsibility of the human who conceived of the idea of the "ageless idol," or is it the responsibility of the computer, whose unique attributes make this "sterilized" version of the body possible in the first place? The answer is a mixture of both.

The Vocaloid fandom's relationship to ICTs is one of necessity; without the development of both the software itself and the infrastructure the fandom relies on, the fandom would essentially not exist. In the Vocaloid fandom, there exists several degrees of *extended agency*, which is a human/object relationship wherein an action cannot be carried out without either the person-side or the object-side of the equation being a present factor (Hanson 92). Firstly, the human-Vocaloid extended agent makes creating works with the software possible in the first place. There is another layer of agency to be found in all of the websites that the community uses to post their works and communicate with one another, some notable examples including Nico Nico Douga and YouTube. In addition, the infrastructure may be of great use to those who use the software itself. Activity Theory (AT) can be used to explain how this may be the case. The theory explores how social interaction is a crucial part in developing "cognition as well as personality and motor skills" (Keating 529). While, Vocaloid users are not developing motor skills or cognition through their use of the software, the social outlets that the community infrastructure relies on may have utility in gaining knowledge about how to use the software. This could potentially be the subject of a possible future study.

However, the ICTs that make up the underlying infrastructure of the community cannot solely explain the amount of fan works that exist. It is the "open source ethos" that McLeod (2016) mentions that is also relevant to explaining the remix culture of the fandom (505). This raises an interesting point, because, in some ways, it is parallel to the free and open source (FOSS) community, but in others it is not. Through the creativity

that is afforded through the use of Vocaloid and the Hatsune Miku avatar, Vocaloid users can, much like open-source programmers, "experience the joy that follows from the self-directed realization of skills, goals, and talents"; they achieve "a heightened form of individual expression," much like FOSS programmers do (Coleman 4). It is interesting to note, however, that, while the avatar of Miku (and other Vocaloid avatars) is free to be used and manipulated for whatever purpose, the Vocaloid software and engine itself is still proprietary; it can then be questioned how much the FOSS-like attitude is embraced within the fandom.

The subject of using cracked versions of Vocaloid, commonly known as "Pocaloid", is very controversial within the fandom (POCALOID). According to VocaloidWiki, the main moral and ethical concerns that the fandom in general has concerning the use of Pocaloid are the legality issues, especially in terms of violating the EULA (End-User License Agreement), the "shame within the music industry" a producer may garner if it is found out that they have used Pocaloid, and the potential of reduction of sales for legitimate copies of Vocaloid (Controversy Concerns). This attitude is somewhat contrary to that found in the FOSS community, especially the "free software" section. Richard Stallman's "The GNU Manifesto," quoted in the E. Gabriella Coleman book *Coding Freedom*, exemplifies the FOSS attitude towards sharing programs:

"I consider that the golden rule requires that if I like a program I must share it with other people who like it. Software sellers want to divide the users and conquer them, making each user agree not to share with others" (Coleman 69).

Thus, it is possible to critique McLeod's claim of an open-source-like culture from within the Vocaloid community and user-base. While, to an extent, there is openness in the fandom when it comes to the re-appropriation of creative works by others, it is clear that there are limits to how "open" the Vocaloid fandom is, especially when it comes to the topic of the redistribution of cracked versions of the Vocaloid software. In this arena at least, one sees more shades of Bill Gates' infamous, "An Open Letter to Hobbyists," which tears into those that dare to copy software and redistribute it, rather than Stallman's principles stating that all software should be truly free as in both "speech" and "beer" (Coleman 38, 65)

Both the relationship between the essential ICTs of the Vocaloid fandom and the community itself and the uncomfortable relationship between the community and piracy could be future venues for study. Especially useful future research could be an ethnographic study of the Vocaloid fandom done through the lens of a critical orientation, which is "examining ICTs from perspectives that do not automatically and uncritically accept the goals and beliefs of the groups that commission, design, or implement specific ICTs" (Kling 8). The first area that should be studied is how the users of the software use ICTs to not only communicate and gain knowledge from each other, but to upload their content onto the Internet. In addition, a study of the interpersonal aspects of the interactions Vocaloid users have with one another, and the conventions and lexicon they use while discussing the software, would be enlightening. While the Miku avatar herself has been critiqued by Lam and others through sociocultural and feminist lenses, there is a notable lack of use of the critical orientation as applied to the Vocaloid software or

other ICTs the fandom uses. Applying the critical orientation from a fandom-oriented perspective may reveal the shortcomings of existing ICTs the Vocaloid fan base utilizes; it may also assist researchers and programmers in developing singing synthesis software in the future. Additionally, an ethnographic study could be implemented to examine certain aspects of the community that were previously mentioned, such as the attitudes towards piracy and relationships with gender. In this arena, it may be most beneficial to first study "overseas fans" (those who live outside of Japan) who are mostly consumers of creative works produced with Vocaloid, rather than producers. Additionally, an ethnographic study of other, similar fandoms centered on the use of singing synthesizer software, such as the freeware program UTAU, is also an area of potential future research.

The literature concerning the Vocaloid fandom and Hatsune Miku can offer a guide to future research, both in what has and has not been covered. This future research should start with studying both the communications of active users of the software, and passive consumers of the cultural works produced with the software. As mentioned before, ethnography should be a key component of future study in order to examine crucial themes surrounding the use of and the cultural aspects of the software. These studies could look to both previously existing literature concerning the Vocaloid community and its themes, as well as social informatics theory and Kling's orientation frameworks as initial guidelines. In addition, this research could be used in the future to study other fandoms and communities primarily centered on the creation of artistic works, especially ones that are also centered on the use of similar software.

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Improving Student Outlook: Amending IU-South Bend Banded Tuition

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Abstract

This research attempts to help traditional and nontraditional students and Indiana University Administration understand the preparedness as well as implications of the banded tuition policy at Indiana University South Bend. We have been successful in researching the college market and the demographics of South Bend. The goal of our research is to understand banded tuition policy and discover the effects of the new policy on nontraditional students. The following report will cover the different demographics of students which include Traditional and Non Traditional students at Indiana University-South Bend. We will cover several aspects of IUSB and compare them to the flagship IU campus in Bloomington and other regional campuses. The results of our research were discovered using randomized student surveys conducted by our team.

For the sake of our readers, we will define the following terms:

Banded tuition: a term referring to the banded tuition policy at IU South Bend. The banded tuition policy sets a per semester standard price on tuition (equivalent to the cost of 15 credit hours) for all undergraduate students who are taking 12+ credits. This policy is intended to help students graduate in four years and substantially reduce the cost of their education.

Special group of students: A special group of student is defined for the purposes of this paper as the students who enroll as a full-time college student who meet more than two of following criteria: work full time or 25+ hours, have dependents, are the primary source of family income, or pay out of pocket with no financial aid.

Traditional Student: A student under the age of 24 who is taking full time (12cr) courses at a university.

Non Traditional Student: A student who is over the age of 24 and is taking full time courses (12cr).