

# Mapping Wiki User Contribution Types to Motivations for Participation: A Case Study

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**Abstract:** Different classifications of Wiki editor have been proposed. However, so far there has been no mapping between user classes based on their contributions and their motivations, which can be useful to design persuasive functions in wiki systems to increase participation. In this study, we attempt to bridge this gap by developing a customized MediaWiki system, used by 10 senior undergraduate students for their coursework. The participants were classified into three editors' classes and mapped to their motivation factors, using the system data and the results from the exit questionnaire.

**Keywords:** wiki editors, collaborative learning, wiki design, motivational strategies

## Introduction

Users differ in their ways of using wiki systems. Many user classifications have been proposed. For example, based on users' frequency of editing, they have been classified as *passive*, *novice* and *committed* users (Bryant, Forte and Bruckman, 2005; Antin and Cheshire, 2010). Also, Gaved, Heath and Eisenstadt (2006) suggest a classification of wiki users, based on their editing behaviour or type of contribution, as *placeholders*, *completers* and *housekeepers*. Understanding users' motivation to contribute is important because it relates to the sustainability of an online community. Researchers have discussed wiki editors' motivations through interviews and questionnaires, and interpreting them from psychological perspective. Among these studies, wiki editors were generally treated as a homogeneous group (Rafaeli and Ariel, 2008; Ling *et al.*, 2005). However, previous researches suggest that users cannot be treated equally (Orji, Mandryk, Vassileva and Gerling, 2013). Yet, no one has matched wiki editors' motivations to statistics of their actions or discussed their motivations based on their classes of editors. In this study, we propose to explore the motivations of different types of wiki editors by analysing their actions and questionnaire' responses.

## Research method

We developed a research tool, a wiki system, called *WikiMentor*, which is a customized MediaWiki system with a content authorship module that mandates login for every user. *WikiMentor* is able to figure out the authorship of each character (or word, sentence) and send email notification to the authors when their contents have been modified. Also, changes made to editors' contributions are highlighted and they are able to accept or deny these changes, which are used to compute their reputation, using the formula  $T = (r+1)/(r+s+2)$ , by (Noorian, Marsh and Fleming, 2011). While the reputation value. However, they were aware that their contribution was rated.

Our participants were 10 undergraduate students of a computer science class on ethics, who engaged in four collaborative writing sessions required for their coursework using *WikiMentor*. The students were encouraged to contribute to the wiki assigned each week using pseudonyms. They could start a page, add, edit and delete contents. To ensure that students make meaningful contribution, their contributions to each wiki article were graded by a teaching assistant. Each student got notified by emails of changes made to their contributions and the resulting changes were highlighted within the wiki article page. Therefore, the user could either accept or reject the changes and this translated into a rating value of the change, that could be either positive (+1) or negative (-1), and was used in computing the reputation of the student who did the change as described in the previous section. For each participant, we collected data on the number of characters contributed and the number of characters of their contributions that survived revision by the other participants, the revisions they made, the time they spent making their contributions and revisions, the numbers of their revisions that were accepted or rejected by the authors. We kept an audit of their contributions, which they could view from the "history" tab once they logged in to the wiki system. At the end of the term, participants were given a questionnaire to evaluate their satisfaction with the wiki system and also to know what features of the wiki system enhance their collaborative writing.

## Results and discussion

We used the number of characters contributed to each wiki article, number of edit times and the type of contribution (add, edit or delete) to classify the editors based on Gaved's (2006) classification. For every

assignment, we classified the participant that made the first contribution – typically a plan for the article, as the *placeholder* editor for that page. Participants who edited others' contents were classified as *housekeeper* editors, while other contributors who were neither first contributors to the page nor engaged in editing others' contents, but were making new and complete contributions were classified as *completer* editors. We defined that each user belongs to a single dominant class in each assignment (Table 1). Since the *housekeepers* engage in many corrections on the entries made by other editors, according to Gaved *et al.* (2006), we assessed their classes by comparing the number of edits made by each participant against the average of edits for a wiki article, in order to classify them exclusively as *housekeepers*. The number of characters contributed by each participant was compared against the average number of characters contributed for the wiki article to classify users exclusively as *completers*. We retained the number of *placeholders* as they were, because there are no other factors that can be used to classify them, beside being the first contributor to every wiki article.

Wiki editors require motivation to enhance participation. Content analysis was used to analyze the questionnaire data. The results of content analysis over participants feedback is shown in Table 1.

Table 1: Classification of the wiki editors

Classification	Student ID	Shared Motivation	Differential Motivation
Placeholder	1, 8, 10	open contribution, email notification when changes were made to their contents, highlighting of the changes made to their contents, other editors accepting or rejecting their contents, and their perceived status to their peers.	Perceived status to peers (i.e. how competent peers think you are)
Completer	3, 6, 7, 8, 9, 10		highlighting changes made by others, other contributors accepting changes made
Housekeeper	2, 4, 5		marks, poor contribution by peers and obligation to fix these contributions

## Conclusion

We classified users based on Wiki usage data and also matched the user classes to the feedback received by these users from the exit questionnaire. Our findings show that Wiki users require differentiated features to motivate participation, depending on the class of editors that they belong to. Specifically, *placeholders* are motivated by their perceived status, or reputation, to their fellow editors. Also, we found that *completers* are motivated by the ratings, whether positive or negative, on their content changes that they get from their fellow editors. In addition, we found that *housekeepers* are motivated either extrinsically by the marks they get on their contents or intrinsically – by the wish to help improve the article or help their colleagues write better. A useful persuasive feature to motivate *housekeepers* would be a visualization of their editing statistics, since having the highest number of edit frequency in the Wiki system is a measurable factor that can be easily mapped to extrinsic rewards. Alternatively, intrinsically motivated housekeepers may be motivated by including a score of user ratings received by correcting other users' contents, demonstrating the helpfulness of their work to others. These design suggestions may be useful also for instructors applying collaborative editing assignments in their classes, since they can include tailored feedback to motivate their students depending on their editor type, which can be determined after the first assignment.

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