

# Motivating Content Contributions to Online Communities: Toward a More Comprehensive Theory

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## Abstract

*This paper extends previous research by proposing a model that can help explain ways to motivate member contributions to online communities (OCs). New features in the model will allow researchers to test the relative effects of extrinsic and intrinsic rewards as motivators in OCs. Some OCs have introduced extrinsic reinforcements like gifts, social recognition, and feedback to entice their community members to contribute. However, some research in non-OC settings has suggested that extrinsic rewards can be detrimental to intrinsic motivation. The new model presents findings from organizational behavior and psychology literature that suggest extrinsic rewards can increase a person's intrinsic motivation under some conditions.*

## 1. Introduction

The Internet has enabled its users to connect to an ever-increasing amount of information and has allowed users to extend their professional and social networks through participation in online communities (OCs) [1, 2]. OCs are social networks of users who share similar interests and practices and who communicate regularly over a common communication medium, such as a news group or a discretionary database [3, 4]. Past research has shown that people contribute to communities largely based on intrinsic motivation [1, 5–8]. Once information is contributed, the community incorporates the information into its existing body of knowledge and uses it to create additional new information, exchange that information, and increase the value of the community's information. Once contributed, information becomes the property of the community and is considered a *public good*, since the information is freely available for consumption without diminishing the information's value and without requiring participants to contribute [6, 8–10]. Community members benefit from an OC because they can expand their social

networks and draw from community information that is more extensive than their own knowledge.

Businesses also benefit from OCs in a number of ways. Businesses can conduct market research by mining community discussions on products and services, sell and advertise their products to their target markets, and leverage communities to help them build and support products [4, 11]. Some businesses run their own OCs, but in other cases, a third party creates and maintains the OC. OCs can be funded by a host organization, willing supporters, advertising, subscription fees, or a combination of the above.

Successful communities, which benefit both members and businesses, engage their members in knowledge-sharing activities to stimulate dialogue, respond to other members' inquiries, build strong ties with other members, and develop long-term relationships with the community. Becoming a successful community is not a simple endeavor, however. To be successful, OCs depend on member contributions and participation. Just building an OC or using technology innovation to attract members is not sufficient [12–14]; unless OC members are intrinsically or extrinsically motivated to help the community, they will find it in their self-interest to consume community information without contributing [10]. To make content contributions, members incur costs in terms of time, effort, opportunity costs, reputation risks, and money. Therefore, OCs often struggle, and in some cases even fail, due to an undersupply of contributions [1, 9]. Factors such as an undersupply of content, poor participation, unorganized contribution, transient membership, and weak ties can cause communities to lose their current membership, can discourage potential members from joining, and can cause OCs to lose their funding [7, 15].

In an attempt to help OC communities thrive, OC researchers have explored potential solutions intended to encourage members to participate and develop a long-term relationship with a community. Some have proposed

different community environments, personality characteristic modifiers [4, 8, 12, 14, 16, 17], socializing opportunities [14, 18, 19], incentive systems for online communities within a firm [9, 12, 20, 21], and community governance structures [20].

Although these factors help community managers better control the fate of their communities, these solutions are not sufficient [12, 13, 20, 21]. OC managers want more reliable control mechanisms that will enable them to successfully create communities without depending completely on the good will of members or expensive governance structures.

In an attempt to encourage meaningful contributions, some OCs have introduced extrinsic reinforcement rewards like gifts, social recognition, and feedback. For example, epinions.com offers profit sharing, Slashdot.com offers feedback and recognition, and Coolsolutions.com offers T-shirts that symbolize that the wearer has made a meaningful contribution. The notion of offering such extrinsic rewards contradicts the theory held by some OC researchers that extrinsic rewards are detrimental to the intrinsic motivation of members [20–22]. Accordingly, current theoretical models have not been designed to explain or test the use of extrinsic reinforcement on OC members.

This paper extends previous OC research [4, 5, 12, 14, 23] in three fundamental ways. First, it combines into a more comprehensive model theoretical constructs from previous research on how to increase contributions. Second, it examines reinforcement factors and clarifies the role of performance measurement in the context of OCs. And third, it presents propositions for a model that can be tested empirically.

The new model can serve as the basis for future empirical work. If supported empirically, this model will help OC managers know how to better design member reinforcements and identify those people who are more likely to contribute because of personality characteristics.

This paper proceeds as follows. First, it examines the challenges OCs face when attempting to attract meaningful member contributions. Next, it presents a theoretical model that attempts to explain factors related to member contribution. Finally, it discusses the implications of this model and proposes future research.

## 2. Community Participation Concepts

### 2.1 Levels of Participation

Several studies have observed and surveyed OCs to find out why, for how long, and to what extent people participate [7, 8, 23–25]. OC users participate in several different ways [7, 18]. The first and most prevalent type of participant browses OCs and consumes information but does not contribute. The second type of participant is the

one who does not find the specific type of information he or she wants and ventures to ask the community a specific question. These two types of participants are called “lurkers.” Several OC observations have indicated that lurkers represent 80–90% of an OC’s population [9, 18]. Lurkers play a key role in the value provided by OCs by consuming useful information; they also ask questions that trigger contributions from others.

The third type of participant is one who not only browses and asks questions, but who is daring enough to respond to other members’ questions, engages in some social interaction, and makes some intelligent distinct contributions. The final type of participant can be considered an OC veteran who has formed strong ties to the community, is part of an established social network, makes more elaborate comments, asks thought-provoking questions, answers complex questions, and is an active participant in community activities. This type of participant is the individual responsible for making the majority of contributions and is a firm participant in the OC. His or her contributions are the primary reason lurkers become interested in the site and decide to contribute [18, 19]. We will refer to the third and fourth type of participant as “contributors,” since they populate the OC with information.

### 2.2 Why People Participate

Research has found that lurkers are attracted to OCs because of their desire for information that is credible, relevant, and easy to find [18, 19]. They also seek opportunities to broaden their contacts and viewpoints [26]. Enjoyment derived from sociability and interaction with others is an additional benefit from participation [14, 23]. Contributors enjoy the same benefits as lurkers but are more strongly motivated to contribute, both intrinsically and extrinsically. Intrinsic motives for contribution include community citizenship [1, 21, 27], generalized reciprocity [8, 28], moral obligation [19, 24], and pro-social behavior [14, 19, 24]. In addition to altruistic motives, research has shown that in some cases, extrinsic motivation plays a role. Some studies (e.g., [8]) have found that some contributors are motivated by self-interest or self-benefit, although research has not found this to be the dominant motivation in the majority of cases.

### 2.3 Size and Searchability Matter

Research has shown that a critical mass of content and participation is required to encourage existing community members to continue to interact and to attract potential community members [10, 14, 19]. Critical mass is achieved when a community has a large enough

contributor base that it can sustain the needs of its contributors and lurkers [2, 26].

If there are too few contributors, there will not be sufficient interaction to maintain the interest of the community members [19]. Also, if there are many contributors but insufficient content organization, disorganized content will cause people to leave [19, 29]. Thus, long-term participation depends on a sufficient base of content and interaction and on the community's ability to leverage technology to reduce the chaos of searching for information [29].

### 2.4 Knowledge-Sharing Dilemma

Although, community managers understand the importance of attaining a sufficient critical mass of participants, they struggle to acquire sufficient contributors. Because online communities use an asynchronous medium for communication, it is left up to the individuals to decide when and how much to contribute [9]. Information stored in an OC is considered a public good [6, 8–10, 28] because OC members can freely consume information without contributing or diminishing the consumption of other members. Thus, OC members sometimes find it in their best interests to consume information and not contribute [28]. Why make the effort to contribute if your consumption does not depend on it? OC research has referred to this social dilemma as the *knowledge-sharing dilemma* [12]. Because insufficient benefits fail to entice contributors, communities either need to find a way to increase the benefits of contributions relative to the costs [12], or they will tend to be undersupplied with contributions. They will also find themselves dependent on the intrinsic motivation of their members to succeed [8]. The only way for OC managers to confront this dilemma is for managers to find ways to raise the potential benefits received from contributing so that the benefits outweigh the costs [12, 28].

### 3. Proposed Model

Research focused on motivating content contribution to online communities has been limited, and most of the research that has been conducted has focused on evaluating the contribution patterns of the community [7, 23, 25, 30–32] or interpreting textual messages posted by individuals [8, 33, 34]. Community-level studies have focused on understanding online communities at a macro level. Their findings focus on how many individuals do and do not contribute, thread length, FAQ existence, etc. On the other hand, textual-level studies have focused on studying OCs at a micro level; their focus is on individuals and whether textual content can explain intentions, trust levels, tie strength, etc. Although, these

two types of studies are important and have given OC researchers different lenses through which to evaluate communities, they are limited in helping scientists and practitioners understand individual actions and reactions to different community events.

Another important approach to studying communities is to examine individuals, motivations, and actions. For this type of research, specific metrics are required that can measure and track individual performance over extended periods [18, 19, 32]. Limited research has been conducted on individuals [4]; the studies that have been conducted include evaluations of the effects of trust [4], sociability [14], and usability [29]. These studies have evaluated individuals in a community before and after the implementation of a mechanism designed to change an individual's behavior. We propose the following OC motivation model that incorporates findings on what motivates individuals to contribute to OCs but also incorporates an expectancy theory framework that has been used frequently in behavior research on the effects of incentives on performance [29, 35, 36].

As shown in Figure 1, the constructs in the model are grouped into three fundamental areas related to encouraging contribution: (1) environmental factors, (2) personal characteristics, and (3) goal setting/goal commitment. These three parts, as well as their respective constituent components, will now be discussed in turn. In addition, propositions are offered relative to each component.

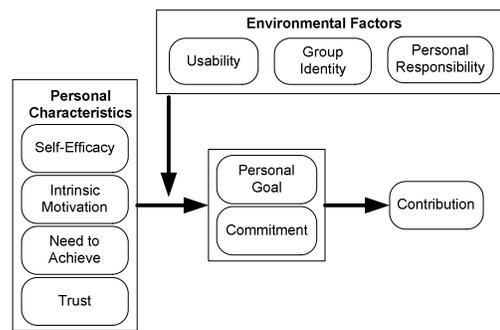


Figure 1. Contribution Model

#### 3.1 Personality Characteristics

The expectancy-theory framework has been used by psychology and human behavior researchers to show that incentives affect the level of an individual's performance by influencing the individual's expectations. Expectations are determined by an individual's personality characteristics, which can either magnify or minimize the effect of an incentive. Prior personality variables tested by the expectancy-theory framework have included self-efficacy and need-to-achieve. Consistent with the theory,

we include these two variables in our model and also incorporate trust and intrinsic motivation as two other variables that OC researchers have tested and labeled as personality motivators that affect contribution. The following is a description of each personality construct included in the model:

**Self-Efficacy.** Self-efficacy is defined as an individual's perceived probability that he or she will attain a goal. Significant evidence indicates that self-efficacy is positively correlated with cooperation: people with higher self-efficacy cooperate more [37]. OC literature specifically mentions three forms of self-efficacy and how they influence an individual's desire and commitment to contribute. The first type of OC efficacy is technology efficacy: individuals who are more comfortable with technology will contribute more [5]. The second type of OC efficacy is information efficacy [6]. Information efficacy is the belief that the information an OC member knows will be helpful to the community. People who believe they possess valuable information will contribute more. The final type of efficacy is connective efficacy, and this type of efficacy is described as the belief that content that is contributed will be received by the OC members [6]. Members that have higher connective efficacy will contribute more. A community's manager can increase contributions from members by increasing members' technology, information, and connective efficacy by training them in OC technology, ensuring contributions are salient, and providing feedback mechanisms that positively acknowledge a member's contribution [12].

**Proposition 1:** OC participants with high self-efficacy will contribute more and participate more frequently than participants with low self-efficacy.

**Need-to-Achieve.** Psychology and organizational behavior research explain that people have different achievement needs. Researchers have found that subjects with higher achievement needs set higher goals and perform better than those with lower achievement needs [38]. OC members who have a greater need –to achieve consider their contributions or participation to be important [39], and they find it enjoyable to work hard, to be compared to a standard, and to be challenged [40]. They feel the need to establish themselves as experts and excel above others [1].

OC theorists and knowledge-management researchers have suggested that online communities should focus on individuals with a high need –to achieve, since these members will dedicate the most time to helping the community through contribution and participation.

**Proposition 2:** OC participants who have a greater need to achieve will be more likely to set higher goals and commit themselves to achieving those goals than members with a low need-to-achieve.

**Trust.** Trust is defined as an individual's willingness to be vulnerable [4]. Individuals perceive less risk in contributing if they trust that the community is benevolent. Studies have shown that trust will lead to greater knowledge exchange [4] and will reduce costs to contribute [17]. From the consumer viewpoint, psychology research has shown that people seek information from those they trust and are willing to listen to those they trust [17]. Information systems research has shown that in environments where there are weak ties, trust can be a substitute [4, 17]. Also, organizational trust, instead of individual trust, can increase a person's desire to share [17]. Communities that want to increase trust should increase member responsibility and tie-strength [1, 4]. In addition, communities can advertise the expertise of their members to help build trust with potential members. Greater trust of member and community expertise will increase participation in the community [4].

**Proposition 3:** OC members who have high trust in the community and in its participants will contribute and participate more frequently than members with low trust.

**Intrinsic Motivation.** Intrinsic motivation refers to doing something because it is inherently interesting or enjoyable [40, 42]. OC members who are intrinsically motivated are willing to work harder, are more committed [41], and are motivated by the act of participating and not by external controls or incentives [21, 42]. Intrinsic motivation is a more powerful enabler of knowledge-sharing than extrinsic motivation or personality variables [21]. Intrinsic motivation is considered to have an undisputed advantage over extrinsic motivation because it lowers transaction costs and increases social capital at minimal costs [43]. Intrinsic motivation is difficult to analyze and manipulate, however [44]. Researchers have used enjoyment [7], satisfaction [6, 8], curiosity, and interest [7] as variables to test an individual's intrinsic motivation in an OC, and some OC research has focused on sociability as a correlated variable [14, 18, 19].

**Proposition 4:** OC members who are more intrinsically motivated will be more committed to the community and will contribute and participate more frequently than members with low intrinsic motivation.

### 3.2 Environmental Factors

Although, the expectancy-theory framework does not include environmental factors, OC researchers have

shown that several environmental factors moderate the effect that personality characteristics have on performance. In our proposed model, we use Cabrera and Cabrera's model that shows how the environmental factors of usability, group identity, and personal responsibility affect the magnitude of an individual's contribution [12]. Also, our model uses DeSouza and Preece's [34] framework of how environmental factors moderate the effect that personality factors have on contribution. The following is a description of the environmental factors that affect performance at an individual level:

**Usability.** OC researchers and information system researchers have found a direct correlation between the ease of use of an OC and the number of contributions made to the community [5]. When communities become too large and chaotic, members will find the amount of information overwhelming and harder to search [1]. The use of sophisticated search algorithms and information indexing can help users better navigate and search large knowledge repositories [29]. In addition, challenges like lack of content and lack of updated content can cause users to become uninterested [18, 19]. In addition, fresh content is another incentive for members, so site managers can use technology to search the Internet for updated content and can then post results to augment community content. Also, delayed postings of contributions can discourage members from posting. OC managers need to ensure that processes are automated to speedily post content [1]. As OC managers make their OC environments more user friendly, interesting, and automated, members will be more likely to feel a desire to contribute because the costs of contribution are lowered and the benefits increased [7].

**Proposition 5:** As ease of use and interesting content increase, more individuals will want to participate and contribute.

**Group Identity.** Researchers who have studied public goods [28] and discretionary databases [10] have shown that a strong sense of group identity can lead to a greater number of member contributions [27]. People who share a common identity are likely to have similar goals, rules, and interests and are therefore more likely to share information [43]. Individuals who are influenced by organizational commitment will share more information [45]. Communities that have fewer transient members and higher levels of participation will engage in more knowledge-sharing activities [23]. Communities that struggle with group identity can create small knowledge-sharing groups to enhance group identity. They can also increase the number of community activities to help members build stronger ties with other members in the

community, which will lead to a stronger group identity [12].

**Proposition 6:** As group identity within a community increases, participation and contributions will increase.

**Personal Responsibility.** Personal responsibility could be considered a personal characteristic, but in the context of the model, as described in past research, personal responsibility is the community's ability to provide a medium where members can be identified and held responsible for their actions.

OC members can choose alias names and may easily find ways to avoid accountability for their actions. OC managers who can increase the personal responsibility of members will also increase their contributions [12]. The ability to identify a member is an important determinant of community communication [12]. People who feel they are being watched by the community will feel accountable for their past and future actions and will therefore self-monitor their behavior [12, 28, 45]. These members will feel a greater need to contribute, and others will be able to learn more and display more empathy [4]. Increasing group identity [17, 45] and building trust are other methods used to increase personal responsibility [4].

**Proposition 7:** The more visible a person's actions are to other community members, the more he or she will contribute and participate.

### 3.3 Goals and Goal Commitment

Prior OC research simply assumed that personality and environmental factors directly affect contribution, but by using the expectancy-theory framework, researchers and practitioners can now better understand how to influence their members to contribute. Researchers can now differentiate between a member's desire to contribute and a member's commitment to contribute, and they are no longer limited to classifying members as contributors or non-contributors. Researchers can now classify members as (1) users with no desire to contribute; (2) users with a desire to contribute, but who do not contribute; (3) users that have a desire to contribute and do contribute; and (4) users that no longer have the desire to contribute, but who still contribute. By expanding the way in which researchers categorize OC participants, researchers can better understand and test what effects intrinsic and extrinsic incentives have on different types of members.

**Proposition 8:** Goals and commitment mediate the relationship that personal characteristics and environmental factors have on a member's degree of contribution.

**Goals.** Expectancy theory explains that OC members or potential members will act in accordance with the expected outcome or with the attractiveness of the outcome [46, 47]. As OC users evaluate the possible benefits and costs of contributing (explicitly or implicitly), they will choose to engage in the activity that gives them the most beneficial expected outcome [28, 45]. This analysis of the benefits and costs of contributing takes into account future expectancy, but it also evaluates past experiences and individual values [48]. Individual values allow a person to maintain consistency in his or her actions. Once members have decided on an appropriate course of action, they will set goals that define the target [48, 49]. Higher goals tend to be accompanied by greater effort and performance [50, 51]. Thus goal setting is an important link in the pathway to contribution.

**Proposition 9:** OC participants that set high goals will contribute more than participants who set low or no goals.

**Commitment to Goals.** Setting a goal is not the same thing as being committed to that goal. As OC members evaluate the benefits and costs of contributing and set goals, they also decide what level of commitment they will exert to accomplish their goals. Opportunity costs like other more interesting projects or forgone wages and leisure can easily distract a member from achieving his or her primary goal and objective. As a goal becomes harder to achieve, commitment to that goal becomes especially critical [35]. Commitment is dependent on an OC member's conviction that a goal is important and possible to achieve [52]. Environmental variables, such as resources available to members, site role models [24], group cohesion [12], and vision of the goal [53] impact commitment. Personality characteristics, such as self-efficacy, strong intrinsic interest, and specific goals, have been shown to increase an individual's commitment to a goal [51]. The ultimate measure of goal commitment is action, but researchers have used an individual's attitude prior to the action as another measure of commitment.

**Proposition 10:** Participants with high commitment to achieving a goal will likely work harder to achieve the goal than individuals with low commitment.

#### 4. Applying the New Model

**Crowding Effects.** Behavioral researchers in other settings have found that when individuals attribute the cause of action to an external reward (extrinsic motivation) rather than to intrinsic motivation, their self-determination is undermined and intrinsic motivation is crowded out by extrinsic motivation [40, 54]. Although this crowding-out effect has been demonstrated in studies, other researchers have found that this tradeoff does not

always occur [55]. Extrinsic rewards can be either controlling or informative. If the reward is controlling, then intrinsic incentives tend to be crowded-out by extrinsic incentives. For example, if an online community manager decides to offer money to its users for their contributions, the users will start contributing in order to earn the money. If the community manager stops offering money, individuals will stop contributing because they now value the monetary reward more than their intrinsic satisfaction. But if the reward is informative, the extrinsic incentive actually enhances the intrinsic motivation. For example, if an OC manager chooses to offer his or her top ten contributors a T-shirt for their many contributions, the users will feel appreciated, and according to the crowding-in effect, they will feel more motivated because the community has acknowledged their efforts.

This crowding-in effect has been investigated less than the crowding-out effect and has not been studied in OCs, but successful OCs have implemented extrinsic rewards and have continued to be successful (Slashdot.com, epinions.com, and Coolsolutions.com). Several OC researchers have observed a possible crowding-in effect, but more research is needed. The crowding theory has introduced the idea that informative extrinsic rewards can actually enhance a contributor's intrinsic motivation.

**Proposition 11:** Rewards and reinforcers that are informative and not controlling will increase a person's desire to contribute by increasing intrinsic motivation.

#### Feedback = Measurement + Reinforcement

The expectancy-theory framework utilizes a set of reinforcement constructs that have been defined and tested by Wright and Kacmar [36] and several other researchers [35, 51] to show that reinforcers like extrinsic incentives can modify a person's performance and contribution. Further research, conducted by Lock, extended the expectancy-theory framework to not only evaluate one-time events, but also to evaluate continual events [56]. By extending the framework, researchers can now evaluate, monitor, and measure an individual's contribution and analyze the effects that different reinforcement mechanisms have on a person's contribution over an extended period of time. The ability to evaluate, monitor, measure, and apply reinforcement is referred to by Kluger and DeNisi as feedback [22]. By incorporating Wright's, Lock's, and Kluger and DeNisi's findings into our OC expectancy-theory framework, we will be able to extend previous research, which focused its study on firm and lab environments, to an actual online community setting.

Figure 2 contains the expanded view of the expectancy-theory OC model that includes the addition of feedback,

in terms of measurements and external reinforcement. This section describes these additions to the model.

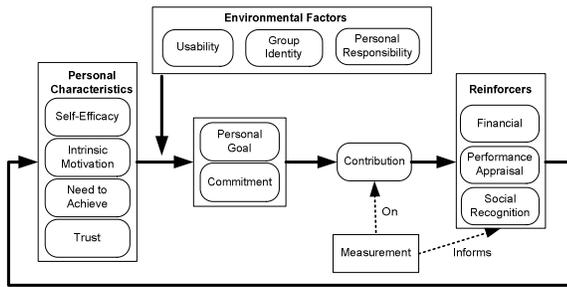


Figure 2. Model Including Feedback

**Feedback.** Feedback is defined by Kluger and DeNisi [22] as “actions taken by (an) external agent(s) to provide information regarding some aspect(s) of one’s task performance.” In order to provide the knowledge of results necessary to influence behavior, an external agent’s action needs to first be measured and then compared to a standard that helps the external agent judge if the action performed has improved or worsened in comparison to the standard. Once the external agent examines the recorded measurements, he or she can customize the application and type of reinforcement mechanism needed to modify or promote current behavior. Monitoring an action and applying reinforcement are two separate constructs in the model, each a component of feedback. For example, in order for an online community to apply a feedback mechanism, the community needs to decide on measures that will define successful behavior in a community, such as the number, length, and quality of posts. If a member attains the quota for a given goal, then the member should receive the appropriate reinforcement. Feedback is the process of measuring a person’s performance, comparing it to a standard, and reinforcing action through incentives over a period of time.

**Measurement.** Measurement is not a causal agent in the model because, by itself, it does not directly affect a person’s motivations. For example, experts could measure the quality and quantity of contributions, but if the results of this evaluation are not somehow translated into a reinforcer, it will have little or no direct effect on individual goals.

**Reinforcers.** Firms have primarily used reinforcement through external incentives to increase contributions. Reinforcement research has shown that in certain conditions, reinforcers can strengthen contributors’ existing attributes of self-efficacy, intrinsic motivation, need to achieve, and trust. While reinforcers both impact and are influenced by personal attributes, they may be so

strong in some limited cases that they effectively dominate personal attributes. For example, an extremely strong financial incentive may cause a person to contribute even if they lack intrinsic motivation to do so. Lawler [57] and other researchers who have studied successful implementation of reinforcers have shown that successful reinforcement programs include meaningful content, credible sources, infrequent timing, and saliency. *Meaningful content* focuses on the behavior, which allows the possibility of change, rather than on the person, which implies a fixed personality trait, especially in the case of negative reinforcement [58]. If feasible, effective reinforcement provides models for appropriate behavior [59]. *Credible sources* focus on the trust that the recipient must have in the source, in the person administering the reinforcement, and in the motives and intentions of the source [60].

*Salience* includes the visibility of the reinforcement mechanism. For example, graphical mediums have been found to be more effective than verbal mediums [61, 62]. The *timing* variable describes when and how much reinforcement should be applied. Reinforcement is most effective when given during or soon after the contribution [60]. Moreover, reinforcement should be viewed as a process rather than a one-time occurrence [63]. Reinforcement should be provided infrequently because a sense of competence [64] and personal control [42] are important factors that influence intrinsic task motivation. The feeling of personal control is at its highest when the individual believes that he or she is performing a task solely because he or she likes to do it [42]. Overly frequent feedback undermines this sense of competence and control [60, 65, 66].

Most existing models highlight three types of reinforcers: financial, performance appraisal, and social recognition. The following is a description of the three primary types or reinforcers that have been used when studying reinforcement.

*Financial reinforcers* include monetary and other tangible rewards. While a crowding-out effect can occur with use of financial reinforcers, small monetary rewards have been shown to increase contribution [10]. Research has indicated that financial and other tangible rewards must be applied with wisdom because they neither (1) provide substantive insights about the magnitude of the congruence or discrepancy between the level of the performance outcome and the desired standard nor (2) supply any specific task-related information to guide subsequent performance efforts [67].

*Performance appraisal reinforcers* refer to information provided for users about the value of their contributions [12, 21]. Performance interventions derive their reinforcing power from the information they provide about a contributor’s performance [21, 46, 68]. Widely held agreement across conceptual orientations [46, 51]

indicates that this type of reinforcement regulates human action by requiring users to evaluate how they are performing relative to an internal or external standard or goal. In some cases, information indicating that a person is performing below desired levels encourages additional goal setting and subsequent action.

*Social recognition reinforcers* include attention, recognition, commendations, compliments, and praise [67]. Non-monetary rewards like social recognition can be extremely powerful incentives so long as they are public, infrequent, credible, and culturally meaningful [57].

Performance feedback and social recognition are often used in OCs because (1) they are economical; (2) they allow self-organization of contributions in large sites; and (3) they bring to bear the collective, distributed, and significant human resources available in an OC.

Although OCs have begun to use reinforcement as a means to increase contribution, very little research has been done in an OC setting to investigate when, how much, and which types of reinforcement should be used to increase membership participation in online communities.

## 5. Conclusion

This paper presents a theory about how content owners can increase contributions to their OCs. The model is based on existing organizational behavior, psychology, and feedback literature. It extends current models by (1) including three types of reinforcement factors, (2) detailing goal setting and commitment to the goal, and (3) splitting feedback into measurement and reinforcement.

The model serves as a theoretical foundation for studies that seek to increase contribution to OCs. First, because the model posits that external incentives do, in fact, affect a contributor's internal incentives and goal setting, the potential effects of crowding-out and crowding-in need further study. Second, the application of different measurement mechanisms should be studied (for example, do community members, site owners, or expert panels best measure content, and how often should measurement be done?). Third, since performance feedback and social recognition are often the most economical choices for OC reinforcement, these two reinforcers should be studied to understand the effects of timing, application method, salience, and source. The nature of their relationship to internal incentives is important to understand.

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