

The Role of Trust in E-Participation: Predictors, Consequences, and Design

Maria A. WIMMER^{a,1}, Sabrina SCHERER^a, Markus APPEL^b

^a University of Koblenz-Landau, Faculty of Computer Science,
Institute for Information Systems Research, Germany

^b University of Koblenz-Landau, Faculty of Psychology;
Institute of Communication Psychology and Media Education, Germany

Abstract. E-participation has become subject of considerable research over the past decade. However, trust as a pre-condition and result of e-participation has not yet been extensively investigated in e-participation research. In literature, trust is perceived as a complex construct studied in distinct research disciplines. To identify and implement measures for increasing trust as well as for minimising distrust in e-participation endeavours, a trust model helps to explain the full scope of the trust construct in the context. This contribution introduces a research design that aims on the one hand to analyse predictors and consequences of trust in e-participation based on a trust model for e-participation. On the other hand, a 'trust-by-design' approach for designing and implementing e-participation projects is aimed at. The approach combines empirical research to 'understand' trust factors with design science research for 'innovating' in regards to improving the design of e-participation endeavours by the lessons and insights of the empirical research. Both strands of research also contribute to theory building of trust in e-participation. This paper aims to set the scope of the research, to introduce the research questions and to present the research design with the multidisciplinary setting.

Keywords. E-participation, Trust, Trust model, Multidisciplinary research, Research design

1. Introduction

Citizen participation is a key to a healthy democracy [2], [7]. Roberts defines citizen participation "as the process by which members of a society [...] share power with public officials in making substantive decisions and in taking actions related to the community" [24]. With the wide diffusion of the Internet, the concept of e-participation arose, which refers to citizen participation by means of innovative Information and Communication Technologies (ICT) (see e.g. [15], [16], [26]). ICT provides intriguing opportunities for citizen participation ([12], [15], [18], [22]), yet e-participation projects are not always successful [27]. Panopoulou et al investigated and identified 21 success factors in designing e-participation initiatives, ranging from strategic aspects over capacity building and organisational aspects to integration, project management, value propositions and sustainability [23]. Interestingly, trust is mentioned only in relation to security and privacy, derived from [1] and [17].

¹ Corresponding Author, University of Koblenz-Landau, Faculty of Computer Science, Universitaetsstr. 1, 56070 Koblenz, Germany; E-mail: wimmer@uni-koblenz.de

In literature, citizens' trust is conceived as a variable that predicts whether or not, and to what extent citizens engage in participatory initiatives more generally, and in e-participation specifically (e.g. [31]). To understand trust, several models exist, such as the integrative model of trust by Mayer et al, which conceives trust as a predictor of a risk-taking relationship between the trustor (the citizen as the trusting person or entity) and the trustee (to whom or to which trust is addressed, e.g. an individual, a group, an institution or even an ICT tool). In this model, the link between trust and the risk-taking relationship is influenced (moderated) by the perceived risk that is accompanied by the risk-taking relationship. The risk-taking relationship may yield more or less desired outcomes, which in turn influence the future trustworthiness perceived by the trustor towards a trustee [19]. Another trust model is proposed by McKnight & Chervany. Their interdisciplinary model of trust construct combines different perspectives and interrelations between these perspectives, which classify five trust types (disposition to trust, institution-based trust, trusting beliefs, trusting intentions, and trust related behaviour) [20]. In his conceptualisation, Blind identifies five types of trust in e-government, which are also relevant in e-participation contexts: political trust, social trust, technological trust, moral trust and economic trust [4]. An extensive literature review on trust and e-participation is already carried out by the authors, and the findings are summarised in [29]. The literature review shows that the concept of trust is not extensively researched in the context of tools and processes to support citizen participation. Empirical research is needed to better understand the predictors and consequences of trust in e-participation contexts. Furthermore, research needs to go beyond sole investigation of understanding influence factors. Multidisciplinary research is needed to combine the analytical and empirical investigations with design sciences, i.e. the insights and lessons of empirical research should be incorporated in the design of future e-participation solutions to increase trust and citizen participation.

In this paper, we present a multidisciplinary research design to combine investigations on 'understanding' phenomena of trust in e-participation with research on 'innovating' solutions based on the insights provided by the empirical research. Both strands of research are complemented with research to embark on and to contribute to theory building in the field.

The paper is structured as follows: Section 2 introduces the underlying trust model informing the research. The research design with research questions and the methods to be applied are described in section 3. Section 4 concludes with a discussion of some challenges of such kind of research as well as an outlook on current and further work.

2. Trust model for e-participation

As already outlined in the introduction, different models exist to explain the concept of trust. In an earlier publication, we developed a trust model for e-participation [28], which embarks on the *Integrative Model for Trust in Organisational Settings* by Mayer et al [19] and extends this model with facets of the *Interdisciplinary Model of Trust Constructs* by McKnight and Chervany [20]. It also adds elements to the integrative model of Mayer et al that are based on findings of own experiences in e-participation research and on literature review [29], including insights from information systems research (e.g. [13]), e-participation research (e.g. [17]), e-government research (e.g. [4]) and information technology research (e.g. [32]).

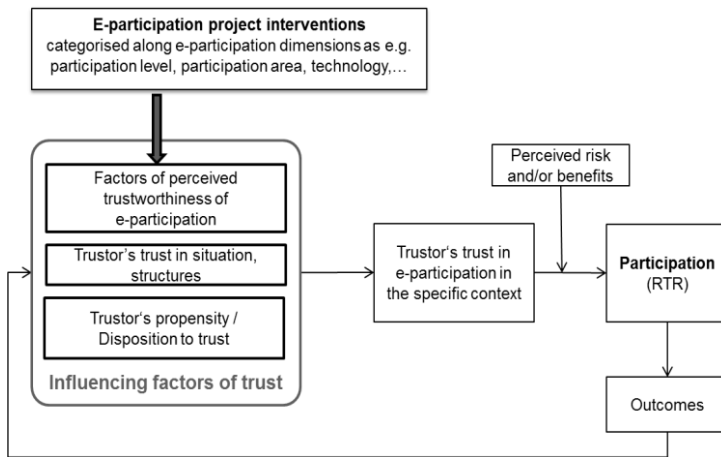


Figure 1. Trust model for e-participation (abstract view) as foundation for the research work

The trust model for e-participation is the foundation for the research work introduced in this paper. It is presented in Figure 1 in an abstract view. Subsequently, the main elements of the model are outlined:

Influencing factors of trust suggested in literature such as:

- *Trustor's propensity / disposition to trust* refers to the willingness of the trustor to trust others, as „some parties are more likely to trust than are others” ([19] pp. 714-715). McKnight and Chervany ([20], p. 38f) suggest to incorporate ‘faith in humanity’ and ‘trusting stance’.
- *Trustor's trust in situation and structures* covers ‘institution-based trust’ suggested by McKnight & Chervany [20], which includes trustors' trust in protective structures “that are conducive to situational success” such as legal and technological measures to protect from privacy loss ([20], p. 37).
- *Factors of perceived trustworthiness of e-participation* covers trustworthiness of other actors, of ICT tools and other relevant concepts in e-participation contexts (e.g. processes). Mayer et al. propose ability, benevolence, and integrity as variables to measure trustworthiness of actors ([19], p. 717ff). Lankton & McKnight propose functionality, reliability, and helpfulness as the factors to assess trustworthiness of tools [13]. Own e-participation research indicates that trusting the process of participation might be another facet of trust to measure. Söllner et al suggest performance and purpose of e-participation projects as factors [32].

Trustor's trust in e-participation in the specific context is a function of all above influencing factors of trust.

Perceived risks and/or benefits involves “trustor's belief about likelihoods of gains or losses outside of considerations that involve a relationship with the particular trustee” ([19], p. 726). It also includes trustor's belief about advantages and positive outcomes.

Participation refers to the action taken by the trustor as a result of trust, i.e. whether or not a trustor will engage in a RTR (Risk-taking-relationship, [19], p. 726).

Outcomes correspond to the concept in Mayer et al.'s model ([19], p. 728) that reflect positive or negative impact on influencing factors of trust in a next iteration of trust and RTR; in which form this impact can happen is still subject of research.

E-participation project interventions refer to characteristics that might influence factors of perceived trustworthiness of e-participation due to different design and implementation choices, settings of an e-participation project (cf. "Web Vendor Interventions" cited in [20], p. 44), or key e-participation dimensions ([15], p. 6).

The trust model for e-participation as presented here provides the foundation for our research, whose research design is introduced next.

3. Research Design

3.1. Research objectives and research questions

The overall scope and research design is depicted in Figure 2, showing in the grey box an abstract view of the trust model for e-participation introduced in the previous section.

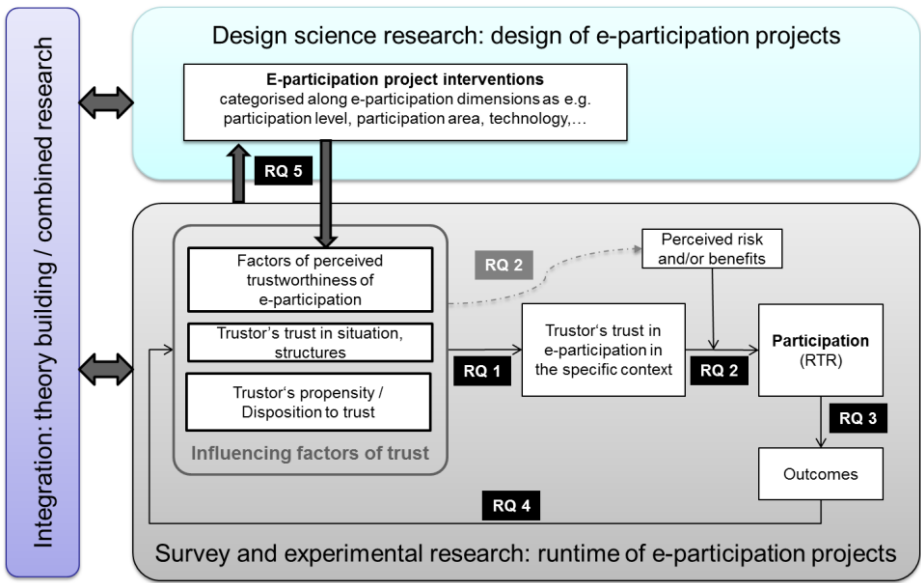


Figure 2. Research design with scope, types of research and research questions reflected along an abstract trust model for e-participation

The research involves four specific objectives and related research questions; the first three objectives support "understanding" of phenomena through empirical studies and incorporate four research questions (RQ 1 to RQ 4 within the grey box labelled "Survey and experimental research"). The fourth objective contributes to "innovating" through design guidelines for e-participation solutions and is reflected with RQ 5 (in the turquoise box labelled "Design science research"). The objectives are informed by - and likewise feed back findings to - theory (the bluish box) as is indicated with the arrows in the figure. The interplay between "understanding" and "innovating" is displayed with arrows, too. Next, the four specific objectives and research questions are introduced.

The first objective is to identify predictors of trust and risk-taking relationships in the e-participation context. These predictors reflect variables of the potential users (the

trustors) such as general propensity to trust, attitudes towards e-participation, self-efficacy, digital literacy, media use, etc. (cf. [6]; [33]). They also reflect variables of the e-participation actors, processes and ICT tools that may affect perceived trustworthiness and - in turn - trust and actual behaviour of a trustor in e-participation offers. The research question (indicated with RQ 1 in the figure) is: *Which factors influence trust of potential participants (trustors) in e-participation in a specific context?*

The second objective is to examine the interplay between trust and participation given variations in citizens' perceptions of risks and benefits of engaging in e-participation. The research question (RQ 2) is: *Which risks and benefits influencing the decision to participate are perceived by trustors, based on the trust in e-participation in the specific context?* The dotted grey arrow from the 'influencing factors of trust' box to the 'perceived risks and/or benefits' box is also labelled with RQ 2 as the influencing factors may directly moderate perceived risks and/or benefits outside the trust function.

The third objective is to examine the consequences of taking (or not taking) part in an e-participation. We aim to get an understanding and shed light on how patterns of a participation experience (the RTR) relate to immediate outcomes (e.g., evaluations of the experience) and more long-term changes in trustor's variables (like attitudes towards e-participation, attitudes towards the trustee, self-efficacy). Two research questions embody this objective: RQ 3 - *What potential outcomes may the trust relation of a participation (RTR) deliver?* RQ 4 - *How does the (non-)participation of trustors in e-participation endeavours affect the influencing factors of trust? (trustor's propensity, trust in situation and structures, and perceived trustworthiness of e-participation (tools, actors, process, etc.)).*

Based on a better understanding of the antecedents and consequences of e-participation, the fourth objective is to develop guidelines for designing and implementing e-participation tools and processes that receive higher trust (i.e. contributing to realise trust-by-design). The research question (RQ 5) is: *Based on insights of RQs 1-4 determining causal relationships within the e-participation initiatives, how should e-participation initiatives be designed to positively influence the factors of perceived trustworthiness of e-participation?*

3.2. Methods employed in the research

To investigate the five research questions, a three-fold methodological approach is chosen, based on the three types of research as indicated in Figure 2:

1) *Theory building* by studying and reviewing existing theory and empirical literature on trust, trust and e-participation, and related contexts from different disciplinary perspectives. The study of theory contributes to extend the body of theoretical knowledge through findings of the review and of the other two types of research (the dependencies are in both directions and are realised over time). Based on such review, the underlying trust model for e-participation (cf. section 2) will be validated and developed further. The literature review will unveil a number of variables already studied conceptually or empirically. Relationships between variables that have attracted substantial attention by empirical research will be evaluated by means of a quantitative meta-analysis. For the meta-analysis, empirical literature on e-participation (e.g. [11]) as well as literature on other risk-taking online behaviours (e.g., in the field of e-commerce, [3]) and on participatory behaviour in the political realm will be inspected (without violating a need for homogeneity among studies, [14]). Theory

building will support the investigation of the five research questions by providing underlying theoretical models and by identifying variables influencing trust that have been studied in literature before (empirically, conceptually and theoretically).

2) *Empirical research (longitudinal and experimental studies)* to gather insights and evidence to better understand which factors influence trust in e-participation endeavours, and under what conditions. The integrative model for trust [19] as well as the trust model for e-participation (cf. section 2) include relationships that can be examined empirically. A longitudinal study using surveys allows to investigate the perception of trust along citizen participation in an online participatory budgeting project. Participatory budgeting involves citizens in the planning of the annual budget of a municipality or city. Citizens who engage in such an e-participation project will be followed at different points in time. Psychometrically pre-tested scales to assess the key variables will be used. The data will be analysed using structural equation modelling (SEM, [5]; [9]). Citizens who do not participate in the participatory budgeting project will be surveyed through paper-based questionnaires and/or interviews. These data will supplement the findings of the online surveys. To strengthen the assumption of causal relationships, selected relationships will be examined in a laboratory environment, where experimental methods will be used. The research in this strand will help to answer research questions 1 to 4, which focus on "understanding" phenomena that influence trust in e-participation contexts.

3) *Design science research* to develop guidelines and a trust-by-design development framework / engineering approach. Insights derived from the previous research activities will be used to inform guidelines to design and implement trustworthy e-participation processes and tools. These processes and tools are supposed to help overcoming current obstacles in e-participation success by increasing trust in tools, processes and actors. The guidelines will enrich the reference framework for e-participation projects [30] and will support the development of a "trust by design" approach for e-participation similar to Keen [10] who put forward such a concept for e-commerce. With this, RQ 5 will be answered. *Design science research* [8] guides this research. In line with Hevner et al ([8], p. 77), the design and evaluation of guidelines as well as the extension of the reference framework and the development of the "trust-by-design" approach will rely on findings generated by activities in 1) and 2) above and on experiences collected in previous research activities. Likewise, activities in this strand of research will provide new grounds for empirical research to understand influence factors changing after application of a new "trust-by-design" approach of design science research, and it will also contribute to theory-building as aimed at in 1).

The ultimate principle in this research design is that teams from social sciences, communication studies and psychology collaborate with information systems and e-government researchers to ensure an effective complementarity and transition of research findings from one strand of research to the other. In the figure, these interrelations across disciplines and demands for collaboration are indicated with the dark-grey shaded arrows.

4. Discussion and Outlook

As outlined before, the nature of the research questions raised in the research design requires cooperation across different research disciplines. First results of a fertile inter-disciplinary cooperation have already been demonstrated in the drafting of the trust

model for e-participation. In the current project, researchers from psychology and communication studies collaborate with information systems and e-government researchers. The research presented in this paper will continue this successful collaboration in a more structured, systematic and three-fold methodological approach as presented before.

Different challenges have to be borne in mind and resolved in such an inter-disciplinary research cooperation as e.g. different understandings of terms, different schools and methodical approaches, different publication outlets, or different value propositions and perceptions of what rigorous research is. A major challenge has been so far the difference in the research methods applied. Exploratory and descriptive qualitative research is identified as valuable research to construct “definitions and productions of typologies, driving subsequent quantitative research” ([25], p. 552). Difficulties of evaluating e-participation initiatives are e.g. that only few quantitative results are available that can be compared with each other ([26], p. 420). Traditionally, psychology bases on quantitative research approaches ([21], p. xvii) – even if mixed-method approaches are also applied in psychology nowadays (see e.g. [21]) – while in design science research and in research closer to technical disciplines, engineering approaches and conceptual modelling are crucial and well accepted methods, besides empirical methods (both, qualitative and quantitative). The tree-fold approach suggested in this paper tries to overcome this challenge by integrating different research methods. It also better ties theory and empirical / conceptual research together.

Current work of this research investigates literature of different disciplines on trust theories and empirical studies as described in the first methodical outlet of the research design section. Findings will inform the empirical research and design sciences research. Besides the literature analysis, we will elaborate a questionnaire for the longitudinal study of trust in participatory budgeting. The research work in the multidisciplinary team is planned to continue for several years. Besides the objectives of the research as presented in this paper, insights will be gained on factors impacting the success of multidisciplinary collaborations as well as on the triangular composition of the research design, involving theory building as well as empirical research for gathering understanding of trust in e-participation and design science research for innovating e-participation designs towards more trustworthy solutions.

References

- [1] Aichholzer, G., & Westholm, H. (2009). Evaluating eParticipation projects: Practical examples and outline of an evaluation framework. *European Journal of ePractice*, 7, 27–44
- [2] Barber, B. (1984). *Strong Democracy: Participatory Politics for a New Age* (Vol. 1986). Berkeley: University of California Press.
- [3] Beldad, A., De Jong, M., & Steehouder, M. (2010). How shall I trust the faceless and the intangible? A literature review on the antecedents of online trust. *Computers in Human Behavior*, 26, 857–869.
- [4] Blind, P. K. (2006). Building trust in government in the twenty-first century: review of literature and emerging issues. In 7th Global Forum on Reinventing Government (pp. 26–29).
- [5] Bollen, K.A. (1989). *Structural Equations with Latent Variable*. John Wiley & Sons, Inc., North Carolina
- [6] Campbell, S. W., & Kwak, N. (2010). Mobile communication and civic life: Linking patterns of use to civic and political engagement. *Journal of Communication*, 60, 536–555.
- [7] Habermas, J. (1992). *Faktizität und Geltung: Beiträge zur Diskurstheorie des Rechts und des demokratischen Rechtsstaats*: Surkamp, Frankfurt am Main.
- [8] Hevner, A. R., March, S. T., Park, J., & Ram, S. (2004). Design science in information systems research. *MIS quarterly*, 28(1), 75–105.

- [9] Hooper, J., Coughlan, M.R., & Mullen. (2008). Structural Equation Modelling: Guidelines for Determining Model Fit. *Electronic Journal of Business Research Methods*, 6 (1), 53-60
- [10] Keen, P. G. W. (2000). *Electronic commerce relationships: Trust by design*. Upper Saddle River, N.J.: Prentice Hall.
- [11] Kim, S., & Lee, J. (2012). E-participation, transparency, and trust in local government. *Public Administration Review*, 72(6), 819–828. doi:10.1111/j.1540-6210.2012.02593.x
- [12] Kubicek, H. (2014). Staatliche Beteiligungsangebote im Internet – Ein Überblick. In K. Voss (Ed.), *Bürgergesellschaft und Demokratie. Internet und Partizipation* (pp. 263–298). Springer Fachmedien Wiesbaden. Retrieved from http://dx.doi.org/10.1007/978-3-658-01028-7_15
- [13] Lankton, N. K., & McKnight, D. H. (2011). What does it mean to trust facebook? Examining technology and interpersonal trust beliefs. *The DATA BASE for Advances in Information Systems*, 42(2), 32–54. doi:10.1145/1989098.1989101
- [14] Lipsey, M. W. & Wilson, D. B. (2001). *Practical meta-analysis*. Beverly Hills, CA: Sage.
- [15] Macintosh, A. (2004a). Characterizing e-participation in policy-making. In *Proceedings of the 37th annual hawaii international conference on system sciences (HICSS)*. Los Alamitos, CA, USA: IEEE Computer Society.
- [16] Macintosh, A. (2004b). Using information and communication technologies to enhance citizen engagement in the policy process. In (OECD 2004).
- [17] Macintosh, A., & Whyte, A. (2008). Towards an evaluation framework for eParticipation. *Transforming Government: People, Process and Policy*, 2(1), 16–30. doi:10.1108/17506160810862928
- [18] Maier, J. (2007). Web 2.0 - Moderatorenrechte für alle? Gibt es eine E-Partizipation 2.0 im Web 2.0? In *Beiträge zur Demokratieentwicklung. E-Partizipation: Beteiligungsprojekte im Internet* (pp. 282–296). Bonn: Stiftung Mitarbeit.
- [19] Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organization trust. *Academy of Management Review*, 20, 709–734
- [20] McKnight, D. H., & Chervany, N. L. (2001). Trust and distrust definitions: one bite at a time. In R. Falcone, M. Singh, & Y.-h. Tan (Eds.): *LNAI, Trust in Cyber-societies* (pp. 27–54). Springer-Verlag Berlin Heidelberg.
- [21] Mertens, D. M. (2014). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods*. Sage Publications.
- [22] OECD. (2004). *Promises and problems of e-democracy, challenges of online citizen engagement*. Retrieved from <http://www.oecd.org/dataoecd/9/11/35176328.pdf>
- [23] Panopoulou, E., Tambouris, E., & Tarabanis, K. (2014). Success factors in designing eParticipation initiatives. *Information and Organization*, 24 (4), 195-213
- [24] Roberts, N. (2004). Public Deliberation in an Age of Direct Citizen Participation. *The American Review of Public Administration*, 34 (4), 315-353. doi: 10.1177/0275074004269288
- [25] Rowe, G., & Frewer, L. J. (2004). Evaluating public-participation exercises: a research agenda. *Science Technology Human Values*, 29(4), 512–556. doi:10.1177/0162243903259197
- [26] Sæbø, Ø., Rose, J., & Flak, L. S. (2008). The shape of eParticipation: characterizing an emerging research area. *Government Information Quarterly*, 25(3), 400–428. doi:10.1016/j.giq.2007.04.007
- [27] Sæbø, Ø., Flak, L. S., Sein, M. K. (2011). Understanding the dynamics in e-Participation Initiatives: Looking through the Genre and Stakeholder lenses. *Government Information Quarterly*, 28(3), 416–425.
- [28] Scherer, S.; Wimmer, M. A. (2014): Conceptualising Trust in E-Participation Contexts. In: *Electronic Participation. 6th IFIP WG 8.5 International Conference, ePart 2014*. Springer Berlin / Heidelberg. Nr. 8654. S. 64-77.
- [29] Scherer, S.; Wimmer, M. A. (2014): Trust in e-participation: Literature review and emerging research needs. In: *ICEGOV2014 8th International Conference on Theory and Practice of Electronic Governance*. ACM. S. 61-70.
- [30] Scherer, S.; Wimmer, M. A. (2011): Reference Framework for E-participation Projects. In: Tambouris, E.; Macintosh, A.; de Bruijn, H.: *Proceedings of Third International Conference on eParticipation (ePart 2011)*. Springer Berlin / Heidelberg. Nr. 6847. S. 145-156.
- [31] Shah, D., Schmierbach, M., Hawkins, J., Espino, R., & Donovan, J. (2002). Nonrecursive models of Internet use and community engagement: Questioning whether time spent online erodes social capital. *Journalism & Mass Communication Quarterly*, 79, 964-987.
- [32] Söllner, M., Hoffmann, A., Hoffmann, H., Wacker, A., & Leimeister, J. M. (2012). Understanding the Formation of Trust in IT Artifacts. In *Proceedings of the International Conference on Information Systems (ICIS)*, Orlando Florida, USA.
- [33] Xenos, M., & Moy, P. (2007). Direct and differential effects of the Internet on political and civic engagement. *Journal of Communication*, 57, 704-718.