ABSTRACT

Evaluating and monitoring large-scale distance learning programs require different techniques, systems, and analysis methods. This work presents challenges in evaluating and monitoring digital inclusion training programs, considering the aspects inherent in large-scale distance training, and reports an approach based on network and distance learning. The paper has the following objectives: (i) apply algorithms to extract indicators from interaction networks, in a real scenario and consolidated training based on distance learning; (ii) apply algorithms to correlate interaction indicators with other indicators related to the use and participation in learning environments; and (iii) discuss the relevance of the obtained indicators to promote feedback with information critical to the success of a large-scale distance training program.

Keywords: Bayesian Networks, Digital Inclusion, Distance Learning, Large-Scale Training, Social Network Analysis

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1. INTRODUCTION

There is a consensus that access to Information and Communications Technology (ICT) is somewhat indispensable for economic development, social equality, better education and cultural enrichment in any country. Moreover, eGovernment initiatives worldwide are focused on integrating ICT into government services, improving the accountability, quality and efficiency of provided services (Gupta, Dasgupta, & Gupta, 2008; Matheus, Ribeiro, Vaz, & Souza, 2010).

In addition to increased efficiency in its actions, this integration encourages transparency and publicity, providing a useful platform for citizens’ engagement through participation and cooperation in government processes (Linders & Wilson, 2011).

Closing the digital divide is imperative, as ICT services are essential for supporting e-participation activities as well as for social and economic development. According to Macintosh (2004), the general objectives of e-participation initiatives are the following: i) reaching a wider audience to enable broader participation; ii) supporting participation through different technological applications considering citizens’ different levels and technical skills; iii) providing relevant information in a more accessible format and understanding better the target audience so that they can contribute more effectively; and iv) engaging a wider and non-participating audience to allow higher reflective contributions and support deliberative debate.

The high digital divide levels pose a problem for increasing citizens’ democratic participation using digital communication tools. In Brazil, as a result of extraordinary territorial dimensions and the discrepancy in investments, many rural communities and people remain isolated from global trends and government actions, as shown by some indices with respect to access. The latest National Household Sample Survey, published by the Brazilian Institute of Geography and Statistics (IBGE, 2009) reveals that in 2009, approximately 34.7% of the population had computers and 27.4% had computers with internet access. While these indices have shown an improvement over previous years, the scenario among regions remains uneven (IBGE, 2009): the southeastern region of the country holds first with personal computers (43.7%) and personal computers with internet access (35.4%). In the south, 32.8% of households had a computer and, in the midwest, 28.2%; the north (13.2%) and northeast (14.4%) had the lowest proportions of households with a personal computer with Internet access.

To improve these indices, the Brazilian government and nonprofit organizations face many challenges in the country (Mori & Assumption, 2007): access to broadband Internet; funding to maintain the existing infrastructure; qualified people to act as digital inclusion agents, with adequate working conditions; participatory governance mechanisms for programs and digital inclusion initiatives; universal access to services at the local level; co-responsibility between the federal and local governments; and developing local government budgetary and administrative capacities.

Many other countries have also recognized this issue, and diverse initiatives have been developed to minimize digital exclusion. These initiatives reflect the relevance and priority of digital inclusion programs at a global level. Several aspects must be considered in the digital inclusion process, prioritizing actions that allow the expanded use of technology resources for all social classes, ideally providing Internet in order to support a more democratic access to information and public and private services. In a multidimensional set of components related to the e-participation concept, strategic principles align three key dimensions (technology, people and organizations) around technology-mediated services to improve institutional governance and citizen involvement (Nam & Pardo, 2011).

Among the public policies to promote digital inclusion, Latin America has been investing to create and use community technology centers or telecenters, where public access to ICT is available to less privileged communities at minimal cost or without any costs (Ngwenyama & Morawczynski, 2009). Telecenters are pub-
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