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Analysis of diverse open source digital tools and Learning Management System users in academics

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Abstract. Digital footprints in the teaching-learning process will enrich learning which in turn will nurture education in a fast-growing economy like India. Technology in the form of digital tools, Learning Management System (LMS) and Learning Object Repository (LOR) will make education more informative and interesting that will realize aptitude among the young generation. This flipped classroom model being very successful among the G8 countries is emerging in countries that are enthusiastic for a revolution in education. The study revealed how technology is integrated effectively into everyday classroom teaching and how it is well received by the learners. It also exposed various open sources that help teachers and students.

Keywords: LMS, Digital Tools, Evaluation, Documentation, Analysis

1 Introduction

Teachers dealing with Gen 'Z' learners have to adopt new techniques that maintain the tempo of their classroom teaching and learning process. Failing to update and maintain the rhythm, they are branded as inefficient teachers in spite of comprehensive subject knowledge and other subject skills. This problem is so common in Asian Universities because of the high student population in these countries. Academic designers and Institutional heads always scrutinize to identify a pertinent solution to resolve these challenges within their economic limitations. The western world and many countries in the European Union have experimented [8] new methodologies in teaching and learning supported by technology for a very long period. Their investments were huge and their policies have accepted failures that occurred during testing and implementing stages. Their investments in software and digital tools that help teaching and learning were enormous in recent days which is quite impossible in developing and upcoming countries with reference to the economy. So the better solution for these economically downtrodden countries to bridge the gap between students and teachers in improving the standard of education is to track the availability of open source tool and software that will be resourceful and support the teaching and learning. This paper is an outcome of an empirical study conducted among the Teachers from different disciplines of Engineering, Language and Social Sciences to understand the effectiveness of various digital tools they started to use in recent years to match with the interest of their learners. It is revealed that Open Source Digital Tools help the teachers for conducting quizzes, collecting assignments, off class discussions, maintaining records and to manage the Classroom online. It is identified from this study that the learners are very comfortable in this kind of interaction between the teachers and them not only inside the class but also outside the class hours. This method is found unique that matches with the interest of the Gen 'Z' learners who are skillful enough using digital contraptions and online resources. The outcome of this study will be beneficial for other institutions across the globe who thinks of implementing digital tools in teaching and learning process. The study also revealed specific tools that are widely used by the teachers and learners.

2 Literary Survey

A case study conducted by Study North Carolina State University [1] professors revealed how the use of google forms helped the administrators to access the quality of teaching in regular intervals and how it helped teachers to give feedback to their students continuously after their weekly discussions and assessments. It was reported that after initiating the use of Google forms time and money spend on paper works were considerably reduced.

Empirical study conducted in King Mongkut's University of Technology Thonburi [2], Thailand reveals how Edmodo offers a modest way for the faculty invariable of their departments to generate, manage and connect students with their classmates and teachers from anywhere and any anytime just with the access to the internet either in their mobile phones, tablets, laptop or the Desktop. Moreover, it also maintains the records of discussions and all other activities between them in a secured manner. The students enter the online class with the code generated and shared by the teacher. The teacher has the complete control over the class preventing trespassers. From this study, it was understood that their students were fond of using such tools that match with their interest.

Centro Escolar University (CEU), Makati City, Philippines conducted [3] a pilot study among their students to identify the efficacy of Schoology (Learning Management System -LMS) in improving the skill of the university students in business writing. During this study, the Pre, Progressive and Post-tests were conducted through Schoology and analysis were also made using the inbuilt facility in it. The outcome of the study suggested their teachers utilize the Schoology as an additional resource to the traditional method of teaching.

GoToMeeting [4] is a feasible option for anyone tangled in meetings that comprise travel by the contributors. School of Social Work, University of Michigan (UM) uses GoToMeeting as a standard tool for its research activities that involve meetings and discussions with national and international research partners, interviews and as a teaching tool that involve students in small group projects. It also provides prospects to organize online workshops and discussions. The Office of Student Services also makes use of it because it is a cost-effective and efficient way to outreach and orientate students to the School.

Action research conducted by Ph.D. scholars in the Curtin University of Technology, Australia exposed [5] how Moodle was significant amongst students for sharing their exclusive curricular knowledge. It was also noted that the sense of accountability amongst the students for ensuring that they engaged one another in mutually productive dialogue. This study also revealed how the positive relationship between the teacher and their students flourished.

3 Problem Statement

The biggest challenge for the existing teachers in higher education institutions across the globe is to satisfy the needs of every single learner and assure there is a considerable augmentation in their subject skill. Though the curriculum and the syllabus are designed to meet the expectation of the teaching-learning process, most of the teachers fail to achieve the objective due to various reasons such as massive classroom strengths, varied proficiency level students in one class, stipulated class hours, teaching and evaluation method and lack of continuous monitoring of students' progress. The uttermost of all is the generation gap. The physical age difference between a student in higher education institute and an experienced teacher is not less than 10 to 20 years hence the thought process and approach towards any action is different. The teacher sometimes is stubborn with their traditional way of teaching whereas the learner expects the teacher to be in their pace. There is a tug of war between the conventional way of teaching and technological way of learning and communicating. In this war, the learners win and the teacher is expected to update and stay on par with the expectation of the student as the education itself is students centric. It is a known fact that the modern generation so-called 'Techno Generation'

feel comfortable in using technical facets rather than sitting in a classroom and listening to lectures for hours together. The right mix of technology in teaching will definitely make the learning effective. Hence the teachers are expected to add technology in some form to make teaching-learning more enjoyable and eloquent that suites the contemporary learners.

4 Limitations of the study

This study was conducted in Vellore Institute of Technology, Vellore, India which is one among the premier technical institutes in India which has over thirty thousand versatile students and over one thousand four hundred Teachers from twenty-nine states and three Union territories of the country. The foremost reason for selecting this University for the study is since the year 2015 it is mandatory for the teachers to use Digital tools of their choice either to conduct quiz, collect assignment, off class discussion, maintain records, conduct the virtual class or to manage the Classroom online. Moreover, teachers and students are exposed to use Digital Pads for writing exams and evaluation, virtual classes connecting students and experts from around the globe, effortless access to digital resources and top of all, Gen ' Z' students who are fair enough to use technology at its best.

5 The methodology of the study

Fig.1: Methodology of the study

5. 1 Questionnaire

The questionnaire was designed very specifically to identify various open source tools and Learning Management Systems (LMS) used by teachers for teaching-learning process (Virtual Class), evaluation (Quizzes & Assignments) and documentation (maintain data). The questionnaire also aimed at getting information on how comfortable the teachers and students feel using the digital tools and Learning Management System in the day to day classes. It also will reveal how often the teachers use digital tools, various tools they use in each semester, teachers eagerness to use new tools and their comfort level while using these open sources. The questionnaire was not derived from any other source rather it is customized as per the need of the study.

5.2 Sampling

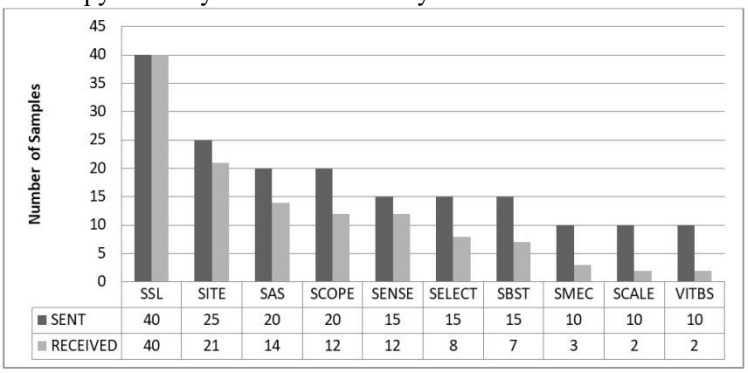
This study adopted the most common approach of quantitative sampling [6] that is to use random samples method in which the sample population is demarcated and all affiliates have an equal chance of selection and the results of studying the sample can then be widespread back to the population. The extent of the test may be decided eventually by perusing those ideal amount fundamental to empower substantial inferences to make settled on something like those number. The bigger the sample size, the more diminutive the opportunity of an arbitrary examining lapse. The designed questionnaire was sent randomly to the teachers of the University in the following Schools

- School of Social Sciences and Languages (SSL)
- School of Information Technology & Engineering (SITE)
- School of Advanced Sciences (SAS)
- School of Computer Science and Engineering (SCOPE)

- School of Electronics Engineering (SENSE)
- School of Electrical Engineering (SELECT)
- School of Bio Sciences and Technology (SBST)
- School of Mechanical Engineering (SMEC)
- School of Civil and Chemical Engineering (SCALE)
- VIT Business School (VITBS)

5.3 Data Collection

Several online free tools are available to conduct surveys. Some of them are Survey Planet, Typeform, Zoho Survey, Google Forms, Survey Gizmo and Survey Monkey. The researcher should identify and choose an apt tool that suits their type of survey. In this study, the questionnaire was shared via Google Forms with the faculty of ten schools which has an average of one hundred faculties and above. Google [9] forms eventually saved cost involved in purchase and printing of questionnaire, time involved in data collection like meeting people explaining them the intention of the questionnaire and organizing the collected data and transferring them from hard copies to soft copy for analysis and further study.



	SSL	SITE	SAS	SCOPE	SENSE	SELECT	SBST	SMEC	SCALE	VITBS
SENT	40	25	20	20	15	15	15	10	10	10
RECEIVED	40	21	14	12	12	8	7	3	2	2

Fig.2: Detail of questionnaire Sent & Received

Nine major schools were selected as shown in Fig.2 and the questionnaire link was shared with an average of 25% the teachers in these schools. The teachers for whom the questionnaire was sent had a teaching experience ranges between 1-20 years and above. The percentage of teachers who has 5 years and less experience did not exceed 5%. The teachers furnished their names and School they belong to. This information helped to classify the data based on School.

5.4 Detailed Analysis

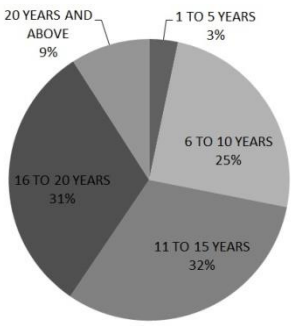


Fig.3: Teaching experience of the samples

It's a clear evidence from Fig.3 that well-experienced teachers are involved in this survey who represent the earlier generations bit away from using technology for teaching and learning process and who believes in traditional teaching method. The intention of this study is to find how these teachers are ready to switch to new

methodologies by understanding the needs of the current generation students who ate technosavy. The majority of samples have teaching experience exceeding 10 years and very few who has less teaching experience.

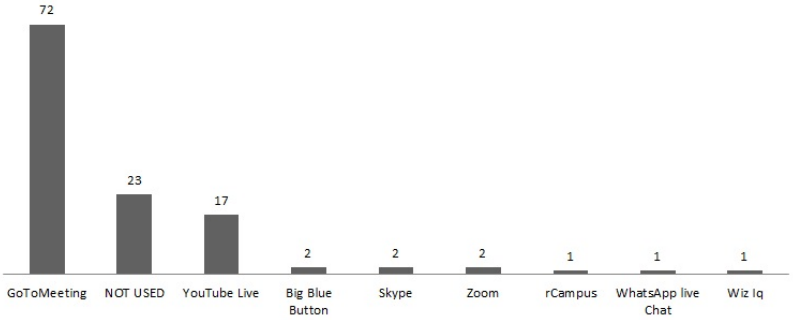


Fig.4: Tool to conduct Virtual Class

It is revealed from Fig.4 that a large sum of teachers is comfortable in using GoToMeeting which is an open source tool generally preferred by corporates to conduct meetings. But it is one among the better tool for the teachers to conduct virtual classes. The advantages include details of students attending the discussions can be viewed. The whole lecture can be scheduled well in advance and the access code of the scheduled class can be shared with the students. The teacher can interact with the students individually during the course of presentation and vice-versa. The audio and video quality is good compared to other open source tools. Some of the teachers also use YouTube live which is a free service provided by Google. But the general issue with this is streaming. During lecture, if the signal is slightly weak at any end the progress is put on hold. It takes a lot of time to resume. There is no facility to record the details of the students who are attending the presentation. The same problem is with Skype, Zoom, WhatsApp live Chat, and Big Blue Button. There are other sources available to host virtual classes but with payments. The focus here is how teachers are using free resources effectively in their class.

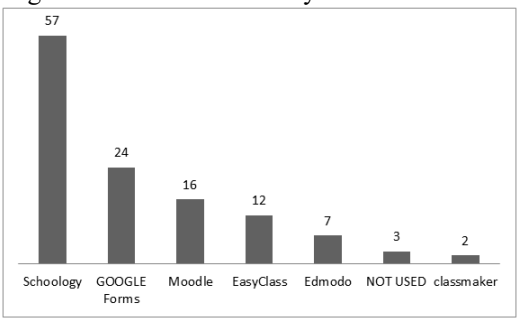


Fig.5: Tool to conduct Quiz

Fig.5 uncover that a maximum number of teachers prefers to use Learning Management System (LMS) like Schoology, Moodle, EasyClass, Edmodo, and Classmaker for conducting Quiz because the questions used for assessment is made available in the question bank and teachers can use the same questions for other classes following the same subject. They don't have to retype the same questions and the key again and again. This saves a lot of time and in a long run, the teacher will have large numbers of questions in the bank. Schoology is widely preferred as it is user-friendly. Google forms are also preferred by some teachers because it can effectively be used for alternative purpose like conducting the survey, meeting invitation and data collection in addition to conducting a quiz.

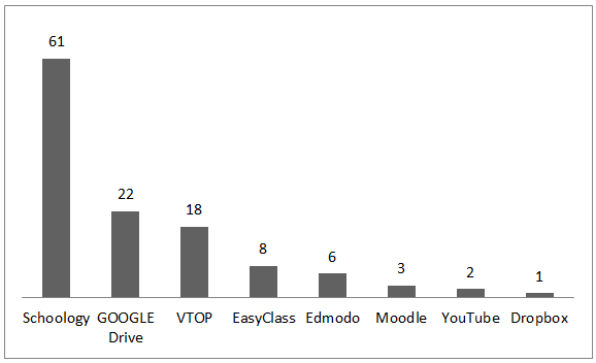


Fig.6: Tool to collect Assignments

Fig.6 shows that collecting assignments and grading them in a colossal class environment is a Herculean task for the teachers. LMS is widely used by the faculty as it substitutes varied functions related to teaching, learning and evaluation process. The survey revealed over 80% of the teachers use LMS in which Schoology is frequently used by a large numbers. Though there are other simple options like Google Drive, Dropbox or institutional customized medium to collect assignments, LMS tops the list as it is user friendly and can store date up to 5GB I free versions. Notification to the teacher on every submission is triggered with complete details of the submission. In addition to this organizing data is simplified automatically in all the LMS. As for as Students, they will have the details of all their submissions, chats they had with the teacher as well as the other group members and all these information can be retrieved at any point of time.

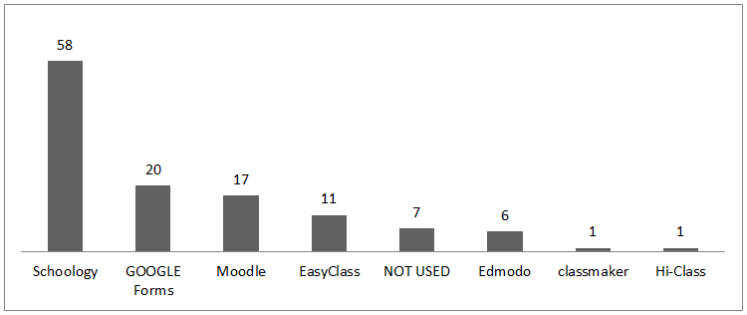


Fig.7: Tool for Automated Evaluation

The greatest challenge for the teachers especially in continents like Asia is evaluation. Invariable of countries, the class size is huge and the work load for each teacher is also more. Though the teachers are accustomed to teach passionately for these bigger classes they find it difficult during evaluation. The higher education scheme of evaluation in India has continuous assessment test that needs to be conducted before a student finally appear in the Semester Final exam. So if a teacher handles three courses in a semester with a class capacity of 60 each, they should evaluate 180 scripts in the form of hard copies or in digital version for every assessment. If there are three internal assessments before the final exams then it comes to 540 scripts. This is the main reason why faculty prefer to use LMS as it saves lot of time and energy being wasted in evaluation. It is a single time investment where the teachers upload the questions and answer keys for different forms of assessments. All the questions along with the key is stored in the database and the teacher can use it for the current batch of students and the same can be used in near future where the teacher need not retype the questions rather they retrieve it from the database. Though there are many LMS that helps the teachers in the automated evaluation Schoology is extensively preferred which is revealed from Fig.7. A Google form is also equally significant for automated evaluation and it also can store the data which can be used for future assessment.

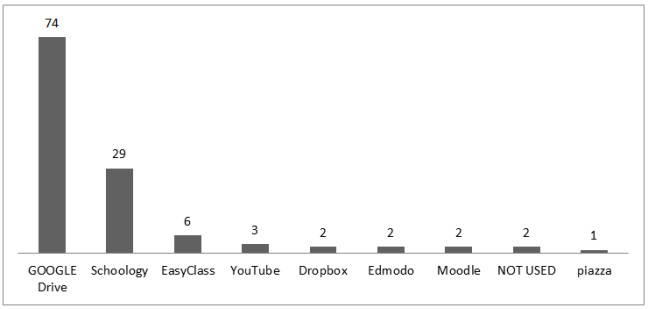


Fig.8: Tool for storing data

For the sake of analysis, documentation and further references the data related to teaching, learning and evaluation has to be stored by every faculty in educational institutions. Storing it in online has advantage as it can be viewed at anytime from anywhere. Fig.8 disclose that Google Drive is the top propriety for the teachers when it comes to storage as it can store varied forms of data that can easily be shared with students at any time. LMS stores data that is only related to the assessments, content related to the subject and information shared to the learners and teachers. Some of the other mode of storage used by teachers includes YouTube for storing and sharing video files, Dropbox, Moodle and piazza

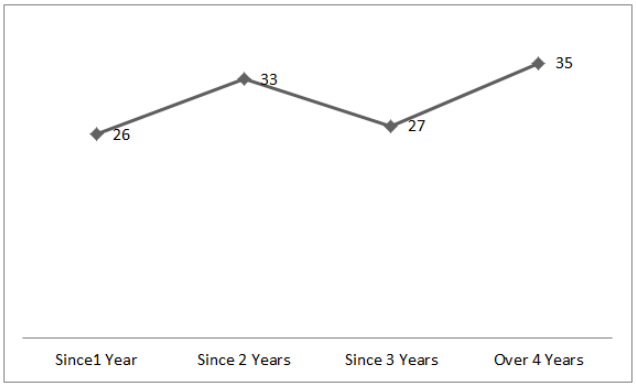


Fig.9: Exposure to Digital Tools & LMS

Faculty in higher education institutions across India adopted to use of technology in teaching and learning in recent years to bridge the generation gap and to make the process more interesting and meaningful. This survey exposed that 28% of them are using digital tools since four years and over 20% of them have just started to use. The percentage of the faculty using Digital tools will be considerably increasing in all forms of educational institution in the years to come as there will be an urge from the learners for technological interwoven learning or blended learning.

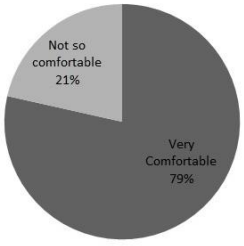


Fig.10 A
Faculty comfort using Digital Tools

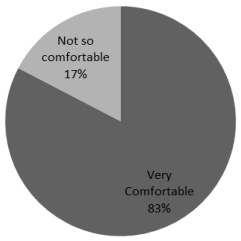


Fig.10 B
Students comfort using Digital Tools

It is very clear evidence from Fig.10A and 10.B that both the faculty and students are comfortable using the digital tools in the teaching and learning process. The main reason for the success rate is the whole communication or the interaction is made available online. The student is free enough to take the assessment or post their assignment from any place on this globe connected to internet and for the teacher posting and sharing of the information to their students is just a click away when they

are connected to the internet. The same can be accessed using their mobile phones as the app developer made it convenient to access the tools in varied formats.

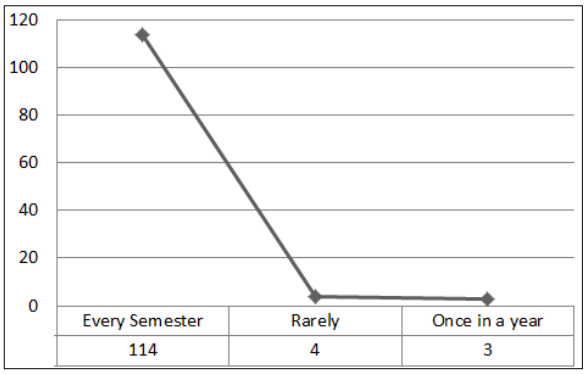


Fig.11: Frequency of using Digital Tools & LMS

Use of digital tools and LMS is habituated among teachers is a well-received outcome from this survey analysis s depicted in Fig.11. 98% of the faculty use one or more of these tools to make learning more effective and to simplify the teacher-student interactive process. There is also an urge from the current generation students to inculcate technology in education to meet the needs of the future. So the institutions across the globe encourage blended learning or the flipped classroom model of teaching to make the educational environment so inspiring.

5.5 Findings

The study made it very clear that Learning Management Systems (LMS) plays a vital role in assisting teachers to conduct Quiz, Collect Assignments, to have an online discussion of the classes, online discussions among students of the same classes and to maintain data of all the above said. It also helps to evaluate standardized test that has pre-defined answers and save a lot of time for physical evaluation for the teachers. Schoology is extensively used by the teachers as they felt that it is easy to administer various activities. Easy class, Google Classroom, Moodle, Edmodo, Classmaker, and Hi-Class are also used by few of them. Except for Hi-Class all other LMS are available free with basic functions which satisfy the needs of the teachers. From the part of students, as all these free LMS can be operated through mobile phone they are very comfortable using it. Students can also retrieve data they submitted in the form of quiz and assignments anytime.

Though LMS can save data such as supporting and additional reference materials related to the subject to be shared among students it has limitations in free versions. Hence the top priority of the teachers is to use Google Drive for storing and sharing the data. Though Dropbox and piazza stores data, G Drive tops the list of preference. Teachers also prefer to use Google components such as YouTube for sharing their video Google forms for conducting surveys and quiz, Google Docs for online interaction and Blogger to update the subject information and other related info that add value to their teaching.

Among various online conferencing facilities which are used for virtual class, GoToMeeting is used and recommended by most of the teachers. Though YouTube live, Big Blue Button, Skype Zoom, rCampus, Wiz Iq and WhatsApp Live are used for virtual class GoToMeeting can collect details of the participants and make it available during the presentation. Moreover it is easy for the speaker and the listener to interact individually or with the group during the presentation. The complete presentation and discussion can be recorded and saved for further references. This feature is made available in free version subjected to a limited time. This makes it unique and that's the reason many prefer this app.

This study discovered that experienced teachers are ready for the change that is to adopt flipped classroom assisted by technology for better reach and prospect.

6 Conclusion

This study revealed that teachers cannot restrict themselves to follow the traditional method of teaching where learning happens inside their class rather they are expected to follow flipped classroom technique which is a strategy of inculcating knowledge off the classes either through online resources or resources that will nurture their ability to understand the concepts. To be very successful, teachers are expected to go hand in hand with the change in the mindset of the student's behavior, adoption to the technical gadget, social media and exposing to latest trends the students follow, for better reach and enhance productivity among their students. By adapting to such environments the teacher reduces the generation gap and teaching-learning process. Teachers embracing themselves to these changes are successful in saving time and energy which in turn used for other productive research and career development.

Reference

1. Gehringer, E. F. (2010, June). Daily course evaluation with Google forms. In ASEE, American Society for Engineering Education Annual Conference & Exposition.
2. Kongchan, C. (2013). How Edmodo and Google Docs can change traditional classrooms. In The European Conference on Language Learning 2013.
3. Sicat, A. S. (2015). Enhancing College Students' Proficiency in Business Writing Via Schoology. International Journal of Education and Research, 3(1), 159-178.
4. Perron, B. E., & Ruffolo, M. C. (2010). A Review of a Web conferencing Technology: GoToMeeting. Research on Social Work Practice.
5. Dougiamas, M., & Taylor, P. (2003). Moodle: Using learning communities to create an open source course management system.
6. Marshall, M. N. (1996). Sampling for qualitative research. Family practice, 13(6), 522-526.
7. Wright, K. B. (2005). Researching Internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. Journal of computer-mediated communication, 10(3), JCMC1034.
8. Van Selm, M., & Jankowski, N. W. (2006). Conducting online surveys. Quality and quantity, 40(3), 435-456.