Research Article

Role of Social media in Learning Science

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Abstract

The means of communication and information dissemination are being revolutionized by social media. Today, there are a plethora of social networking sites to choose from. It is undeniable that social networking platforms have a huge effect on both "digital natives" and "digital immigrants." The researcher attempted to investigate the role of social media in learning science subjects, taking into account the impact of social media on both "digital natives" and "digital immigrants." The study adopted a mixed-method research design. The case study survey method was employed to conduct the research. The purposive sampling method was employed to select a public school from the Dhenkanal district of Odisha. 150 Senior Secondary and Secondary school students studying in classes 9 to 12 participated in the study. A questionnaire was prepared with 30 items to collect the data. The findings of the study revealed that social media plays an important role in the teaching-learning process. Social media when used creatively and mindfully could be very beneficial to the students as well as the teachers. Several drawbacks were identified for using social media in learning.

Keywords: Communication, Engagement**,** Information dissemination, Learning process, Social media, Science Education

Introduction

Technology's rapid advancement has caused a paradigm shift in every aspect of our lives including education (Varish & Sharma, 2020). In this digital age, attempts should be made to improve people's lifestyles to keep up with the latest trend. The recent COVID-19 pandemic turned out to be a blessing in disguise for technology adoption across all social strata. Almost all simple transactions were digital, and people's apprehension about using technology decreased. This could be seen as a move closer to the Government of India's Ministry of Electronics and Information Technology launching the Digital India program, which aims to turn India into a digitally empowered society and knowledge economy. The government has also made continuous efforts in the field of education to close the digital divide. The Ministry of Human Resource Development, Government of India, took one such commendable step by launching Study Webs of Active Learning for Young Aspiring Minds (SWAYAM). In addition, the NEP 2020 proposes establishing a National Education Technology Forum to provide a forum for the free exchange of ideas about how to use technology to improve learning, evaluation, planning, and administration. Formal learning is being replaced by technology-enhanced learning. In recent times, a multitude of educational platforms are available. Technology integration is no longer limited to the classroom. With the ease with which the internet can be accessed, a variety of options for communicating, collaborating, networking, exchanging information, and constructing knowledge are accessible at any time and from any place. One such platform which has become a part and parcel of every individual is social networking sites or social media.

Rationale of the study

The means of communication and information dissemination are being revolutionized by social media. Social media is described by the Government of India's Ministry of Communications and Information Technology as "any web or mobile-based platform that allows a person or agency to communicate interactively and share user-generated content." It is an Internet-based platform that allows sharing of information (Bassell, 2010). Dabbagh and Reo (2011) explained Social media as "a type of online tool used to establish and maintain the connection with friends and acquaintances". It offers multiple opportunities for students to be engaged, form networks, and learn social skills (Dragseth, 2019). The basic aspect of social media is that it links like-minded individuals, allowing them to interact and build awareness that contributes to community sustainability.

Today, there are a plethora of social networking sites to choose from. Numerous software and applications are being produced in the market as a result of technological advances. Collaboration projects, blogs and microblogs, content communities, social networking platforms, virtual gaming environments, and virtual social worlds were all classified as social media by Kaplan and Haenlein in Framework & Guidelines for Use of Social Media for Government Organizations, published in 2010.

It is undeniable that social networking platforms have a huge effect on both "digital natives" and "digital immigrants." According to Oberst et al. (2017), social media is appealing because it serves as a forum for young people to shape social identities. Social media is a "highly visible factor in the daily lives of our students" (Fiona &Ingo, 2018) and has a major effect on psychological well-being and satisfaction (Choi & Noh, 2019). Studies have identified that social media has had a major impact on how people learn (Ellis & Ellis, 2015; Greenhow & Lewin, 2016; Mpungose, 2020). Social media has revolutionized how the new generation "learns, communicates, and develops" (Rajasekhar & Jaishree, 2020). Social media allows for collaborative online learning and can impact both students and teachers (Clement, 2020). In the educational process, social media not only aids in communication and networking, but also in the sharing of learning materials among learners, teachers, experts, and others (Joan, 2020).

Studies have shown that using social media plays a significant role in the teaching-learning process. Learning when combined with social media in teaching prospective science teachers' TPACK was successful (Setiawan & Phillipson, 2019). Social media not only aids in learning but also aids in changing young learners' perceptions and interactions in science (Wilson & Boldeman, 2012). Social media has demonstrated its ability to bridge the gap between science and family by allowing children to engage with science at home through social media platforms (Tyler & Vanstone, 2017). Also, science teachers believe that social media when used as a tool, offers opportunities for students' advancement (Akif et al, 2020). When utilised for collaborative learning, social media has a significant influence on engagement with students, tutors, and virtual knowledge exchange (Ansari & Khan, 2020). Furthermore, the efficiency of social media in strengthening students' communication abilities in the issue of fluids was discovered (Fatimawati et al, 2019). Social media has been proven to be a useful technique for improving communication between teachers and students (Khatun & Al-Dhlan, 2017; Sahrain et al, 2020). The internet and online social media were useful in enhancing productivity

and contentment, with the goals of encouraging internet users to communicate with others and increasing the number of online communication partners among teenagers with complex communication needs (Grace et al, 2014). When used in conjunction with a multimedia-based curriculum, social media has been shown to improve creativity among students studying art, design, and digital media (Al Hashimi et al, 2019). The Physics Learning Media course, which was aided by Instagram, proved excellent in improving students' creative thinking abilities (Irwandani et al, 2020). Furthermore, social media contributed to the improvement of university students' reading skills (Al Momani, 2020). Evidence of extensive social media use was reported in language acquisition (Istifci & Dogan, 2021).

Research questions

1. Do social media play any role in learning science? If yes, how?
2. Is social media a boon or bane for the students in learning science?

Objectives of the study

The researcher after a review of the literature and considering the influence of social media on the "digital natives" as well as the "digital immigrants" felt the need to study the role of social media in learning science subjects. The objectives of the study were taken as:

- To explore the different types of Social Networking Sites (SNSs) that students use.
- To investigate the role of social networking sites (SNSs) in science education.
- To study the benefits and disadvantages of using social media to learn science.

Operational definition

Social media: Social media is a technology-enabled medium where anyone may engage and exchange information, ideas, knowledge, and any kind of expression or thinking.

SNSs: A virtual community that links and allows both students and teachers to exchange ideas, study, educate, and share information and knowledge.

Methodology

Research design: The study adopted a mixed-method research design. The descriptive survey method was employed to conduct the research.

Population

Senior Secondary and Secondary school students studying in the public schools of Odisha were considered as the population for the study.

Sampling methodology and samples

The purposive sampling method was employed to select a public school from the Dhenkanal district of Odisha. 150 Senior Secondary and Secondary school students studying in classes 9 to 12 participated in the study.

Tool

A questionnaire was prepared with 30 items to collect the data. The survey was divided into four parts. The first section included demographic details, such as gender, age, and the class they were studying, as well as the resource availability for access to SNSs. The second section included items for extracting knowledge from SNSs as well as the fundamentals of their use. The third section contains an item about how social media aids science learning and students' perception toward using it as a learning tool. The final segment contains items to determine the

disadvantages, if any, of using social media to learn science.

Result and findings

The analysis of the data indicated various findings which are discussed below.

Demographic findings and general information about social media usage

A total number of 150 students studying in class 9 to 12 participated in the study. Out of which, 62.5 percent were male and 37.5 percent were females. The maximum number of participants (52.8 percent) were studying in grade 11th, while 21.5 percent were in grade 12th students, 13.2 percent in grade 9th and 12.5 percent were studying in grade 10th.

Table-1: Demographic information of the students who participated in the study

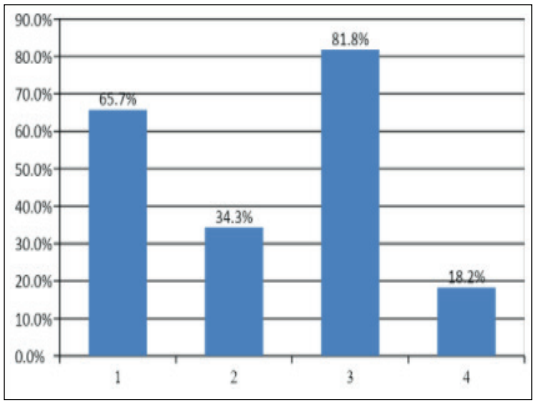
Grade				Gender		Age		
9th	**10th**	**11th**	**12th**	**Female**	**Male**	**13-14 years**	**15-16 years**	**17-18 years**
13.2%	12.5%	52.8%	21.5%	37.5%	62.5%	20.8%	52.8%	26.4%
20	19	79	32	56	94	31	79	40
Total	150			150		150		

65.7 percent of the students reported owning their smartphones while 34.3 percent do not.

97.9 percent of the students confirmed, having an internet connection while 2.1 percent do not have an internet connection.

A maximum of the students (81.8 percent) were found to be active on social media and they reported having a social media account.

Graph-1: Personal attributes of the students



50 percent of the students were found to be using social media mainly to update about the happenings in the world.

63.4 percent of the students were found to be fully aware of the opportunities offered by social media in the learning of science.

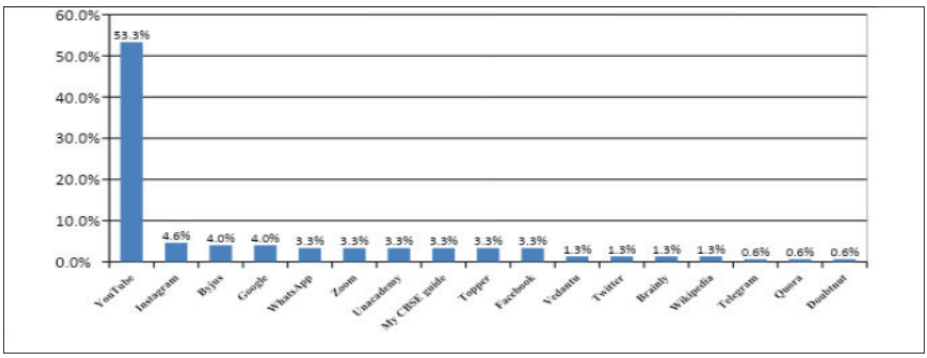
Objective-1: To find out various categories of Social Networking Sites (SNSs) used by the students.

YouTube was the most frequently used SNSs by the students for learning science. Applications that are based on educational purposes like Byju, Unacademy were also found to be in use by the students. Facebook, Whatsapp, Telegram, Twitter were also reported to be used for learning science.

Table-2: (SNSs) used by the students for learning science

SNSs	No. of students using it	Frequency
YouTube	80	53.3%
WhatsApp	5	3.3%
Telegram	1	0.6%
Vedantu	2	1.3%
Zoom	3	3.3%
Unacademy	3	3.3%
Byjus	6	4%
My CBSE guide	3	3.3%
Topper	3	3.3%
Instagram	7	4.6%
Twitter	2	1.3%
Quora	1	0.6%
Facebook	3	3.3%
Brainly	2	1.3%
Wikipedia	2	1.3%
Google	6	4%
Doubtnut	1	0.6%

Graph-2: (SNSs) used by the students for learning science



Objective-2: To explore the role of SNSs in learning science

81.1 percent of the students used social media platforms for learning science. Except for 3.5 percent, 80.6 percent of the students found learning science from the social media platform interesting while 16 percent of them were unsure.

70.7 percent of the students also reported that using social media in learning science increases the interest as well as the attention of students towards the subject.

62.5 percent of the students reported the effectiveness of learning science from social media platforms, while 9.7 percent do not feel its effectiveness.

The students reported that 40.3 percent of the science teachers used social media platforms for teaching, 37.5 percent used it sometimes and 22.2 percent never used social media platforms for science teaching.

Except for 4.9 percent of the students, other students agreed that social media could be used as a learning platform for science.

80.5 percent of the students reported that social media helps to collaborate with other students for science learning.

86.8 percent of the students expressed that social media provides entertaining and mind stimulating activities for learning science which makes learning joyful and interesting.

88.9 percent of the students Stated that social media if used creatively could be used very successfully in learning science.

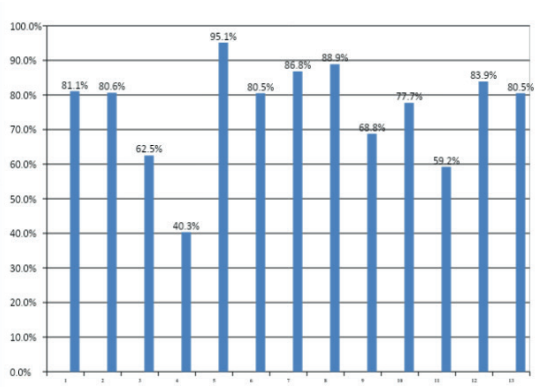
68.8 percent of the students ascertained that social media could be used as a tool for learning sciences by linking it to real-life situations.

77.7 percent of the students felt that social media provides a platform for the students to interact with experts in sciences.

59.2 percent of the students Stated that social media plays an important role in nurturing learners' instinctive curiosity and encouraging the spirit of inquiry.
83.9 percent of the students reported that social media supports various learning styles and through social media, a learner can learn at their own pace.

80.5 percent of the students reported that plenty of learning materials for science subjects are available on social media platforms. It makes them independent learners and can learn anytime from anywhere.

Graph-3: Role of SNSs in learning science



Objective-3: To study the challenges and drawbacks of using SNSs in learning science

43.7 percent of the students reported that social media could be a great distraction for students. It could distract the students from learning and sometimes end up in social media addiction. Moreover, 70 percent of the students opined that social media is not easy for all students to manage for educational purposes.

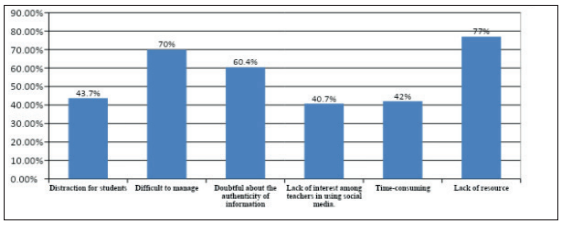
60.4 percent of the students were not sure if social media provides authentic information. The content that is disseminated and the learning materials that are made available online can be deceiving at times.

40.7 percent of the students expressed that there is a lack of interest among teachers in using social media. Because of this social media usage could be restricted in classrooms and schools.

42 percent of the students felt that learning through social media is time-consuming as it requires lots of searching and filtering the information.

77 percent of the students Stated that social media could be restricted in the learning process if proper resources in the form of smartphones, PCs, internet connection, etc. are not available to the students as well as the teachers.

Graph-4: Challenges and drawbacks of using SNSs in learning science



Discussions

According to the findings, the majority of students (65.7 percent) own mobile phones and have 97.9 percent internet access, highlighting the importance of the internet and smartphones in everyone's lives. Zachos et al. (2018) and Lenhart (2015) agree with the study's findings. The study found YouTube to be the most popular social media platform among students, contrary to the findings of Alabdulkareem (2014), Tess (2013), and Sánchez (2014), who found Whatsapp and Facebook to be the most popular media networks, respectively. WhatsApp was proven to be quite successful in increasing teacher and student involvement by Khatun and Al-Dhlan (2017). The study also demonstrates the importance of social media in the classroom. Gray et al. (2013) discovered a similar result in their study. It was confirmed that using social media to collaborate with other students for science learning and interaction is beneficial, which is consistent with Dragseth's (2019) and Wilson and Boldeman's (2012) findings. The study reveals 40.3 percent of science teachers use social media platforms for teaching. It may be due to a lack of resources in educational institutions or a lack of technical knowledge on the part of the teachers. Platforms on social media offer engaging and mind-stimulating activities for studying science, which not only makes learning enjoyable and interesting but also draws the attention of young students. According to the study, social media plays an important role in education and learning. When utilised creatively and efficiently, it promotes learning. This conclusion is consistent with the findings of Alabdulkareem (2015), who

observed that instructors and students are enthusiastic about utilising social media in the classroom, believing that it will enhance their learning experiences. However, the study discovered significant drawbacks to adopting social media as a learning tool. Some of the limitations highlighted in the study, similar to Hussain et al. (2018) were social media addiction owing to frequent use, doubtful information on social media, and a lack of suitable learning materials.

Conclusions

The findings of the study revealed that various information regarding the role of social media in the educational process of learning science. It was found that social media plays an important role in the teaching-learning process. Social media when used creatively and mindfully could be very beneficial to the students as well as the teachers. Several disadvantages of using social media were also identified. It is the responsibility of the teachers and the parents to monitor the usage of SNSs by the students. Digital education should be imparted to students from a very young age. They should be kept aware of the benefits and drawbacks of using social media at all times. To guide and protect them from cyberbullies and cybercriminals, appropriate information should be disseminated at the appropriate time, and in the appropriate direction. Along with the students, the teachers, and the educators should also upskill themselves with new technology. Learning, when integrated with technology, is more interesting and much more impactful.

Reference

Alabdulkareem,S.A. (2015). *Exploring the Use and the Impacts of Social Media on Teaching and Learning Science in Saudi. Procedia Social and Behavioral Sciences*,182,213-224, https://doi.org/10.1016/j.sbspro.2015.04.758.

Al Hashimi, S., Al Muwali, A., Zaki, Y. & Mahdi, N. (2019). *The Effectiveness of Social Media and Multimedia-Based Pedagogy in Enhancing Creativity among Art, Design, and Digital Media Students. International Journal of Emerging Technologies in Learning, 14*(21), 176-190.

Al Momani,M.A.M.(2020).*The Effectiveness of Social Media Application "Telegram Messenger" in Improving Students' Reading Skills: A Case Study of EFL Learners at Ajloun University College/Jordan. Journal of Language Teaching and Research, 11*(3), 373-378. http://dx.doi.org/10.17507/jltr.1103.05

Akif, H.M., Serhan,C.H., & Erkan,U.M.(2020). *Determining the views of the secondary school science teachers about the use of social media in education*. *Journal of Science Education and Technology, 29*(3), 346-354

Alabdulkareem, A.S. (2015). *Exploring the use and the impacts of social media on teaching and learning science in Saudi. Procedia - Social and Behavioral Sciences*, 182, 213 – 224

Ansari, J.A.N., Khan, N.A. (2020). *Exploring the role of social media in collaborative learning the new domain of learning. Smart Learning Environment, 7*(9). https://doi.org/10.1186/s40561-020-00118-7

Balalle, H. (2018). *The impact of social media on the student achievement*. *International Journal of Advanced Research, Ideas and Innovations in Technology, 4*(4), 427-429.

Bassell, K. (2010). *Social media and the implications for nursing faculty mentoring: A review of the literature. Teaching and Learning in Nursing, 5*(4), 143-148. Doi:10.1016/j.teln.2010.07.007

Clement, J. (2020). *Most popular social networks worldwide as of January 2020, ranked by number of active users.* Retrieved from https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users

Choi, D. H., & Noh, G. Y. (2019). *The influence of social media use on attitude toward suicide through psychological well-being, social isolation, and social support*. *Information, Communication & Society.* Doi: 10.108 0/1369118X.2019.1574860

Dabbagh, N., & Reo, R. (2011). *Back to the future: Tracing the roots and learning affordances of social software. Web 2.0-based e-learning: Applying social informatics for tertiary teaching*. Hershey, PA: Information Science Reference.

Dragseth, M. R. (2019). *Building student engagement through social media. Journal of Political Science Education,* 1–14. Doi: 10.1080/15512169.2018.1550421

Ellis, J. B. & Abreu-Ellis, C. R. (2015). *Student perspectives of social networking use in higher education. Key concepts in Informatics and ICT.* Potsdam, Germany: University of Potsdam.

Fatimawati,S., Mursalin, & Odja,A.H.(2019).*The effectiveness of learning using social media to improve student's communication skills in fluids' topics*. *Journal of Physics: Conference Series,* 1521. doi:10.1088/1742-6596/1521/2/022062

Framework & guidelines for use of social media for government organisations. department of electronics and information technology. Ministry of Communications & Information Technology. Government of India

Fiona, A & Ingo. E. (2018). *Using internet and social media designs to contextualise science inquiry learning. School Science Review, 99* (369), 90-95

Grace E, Raghavendra P, Newman L, Wood D, Connell T. *Learning to use the Internet and online social media: What is the effectiveness of home-based intervention for youth with complex communication needs? Child Language Teaching and Therapy.* 2014;30(2):141-157. doi:10.1177/0265659013518565).

Gray, R.; Vitak, J.; Easton, E.W.; Ellison, N.(2013). *Examining social adjustment to college in the age of social media: Factors influencing successful transitions and persistence. Computer Education,* 67, 193–207.

Greenhow, C., & Lewin, C. (2016). *Social media and education: Reconceptualizing the boundaries of formal and informal learning. Learning, media and technology, 41*(1), 6-30. Doi: 10.1080/17439884.2015.1064954

Goodyear, V. A., Parker, M., & Casey, A. (2019*). Social media and teacher professional learning communities. Physical Education and Sport Pedagogy,* 1–13. Doi: 10.1080/17408989.2019.1617263

Hussain, I., Cakir, O., & Candeğer, Ü. (2018). *Social Media as a learning technology for university students. International Journal of Instruction, 11*(2), 281-296. Doi: 10.12973/iji.2018.11219a

Irwandani ., Rinaldi,A., Pricilia,A., Sari ,P.M., & AnugraH,A.(2020). *Effectiveness of Physics Learning Media Course assisted by Instagram on Student's Creative Thinking Skill*.

Journal of Physics: Conference series 1467

Istifci, I. & Dogan Ucar, A. (2021). *A Review of research on the use of social media in language teaching and learning. Journal of Educational Technology and Online Learning, 4*(3), 475-488.

Joan, R. R. (2020). *Influence of social media in the progress of learning. i-manager's school*. *Educational Technology, 16*(2), 31-38.

Kaplan, A. M., & Haenlein, M. (2010). *Users of the world,* unite! *The challenges and opportunities of social media. Business horizons, 53*(1), 59-68.

Khatun,A & Al-Dhlan,K.A. (2017). *Effectiveness of WhatsApp: A Social Media Tool for Student's Activities in Saudi Arabia. International Journal of Technology and Educational Marketing ,7(2).* DOI: 10.4018/IJTEM.2017070102

Lenhart, A. (2015). *Teens, social media and technology overview. PEW Research Center*. Retrieved from http:// www.pewinternet.org/2015/04/09/teens-social-media-technology-2015/

Ministry of Human Resource Development (MHRD). National Education Policy 2020. Government of India.

Mpungose, C.B. (2020). *Are social media sites a platform for formal or informal learning? students' experiences in institutions of higher education*. *International Journal of Higher Education,9*(5)

Mpungose, C.B. (2020). *Is Moodle a platform to decolonise the university curriculum? Lecturers' reflections. Africa Education Review, 1*,1-16. Doi: 10.1007/s10639-019-10005-5

Nicholas, R. (2019). *Beyond the middle school science classroom: Using social media to connect the indigenous sky stories community*. *Teaching Science, 65*(2), 38-47

Oberst, U., Wegmann, E., Stodt, B., Brand, M., & Chamarro, A. (2017). *Negative consequences from heavy social networking in adolescents: The mediating role of fear of missing out. Journal of Adolescence,* 55, 51–60. Doi:10.1016/j.adolescence.2016.12.008

Rajasekhar,S.,& Jaishree, S. (2020). *An Exploratory Study on Internet use and its Application by Underprivileged School Girls. Indian Journal of Educational Technology, 2* (1), 1-20.

Sahrain, S. P., Mursalin ., & Odja ,A.H.(2020).*The effectiveness of learning using social media to improve student's communication skills in waves topics*. *Journal of Physics: Conference. Series.*

Sánchez, A.R., Cortijo, V., Javed, U. (2014). *Students' perceptions of Facebook for academic purposes*. *Computer Education*, 70, 138–149.

Selwyn, N. (2012). *Social media in higher education. The Europa world of learning, 1*(3),1-10.

Selwyn, N. (2016). *Minding our language: Why education and technology is full of bullshit and what might be done about it*. London: Taylor & Francis. Doi:10.1080/17439884.2015.1012523

Setiawan, H., & Phillipson,S. (2019) *The correlation between social media usage in academic context and self-efficacy towards TPACK of prospective science teachers in Indonesia. Journal of Science Learning*, *3*(2), 106-116

Tess, P. (2013). *The role of social media in higher education classes (real and virtual)—A literature review. Computer Human Behaviour,* 29, 60–68

Tyler, T., & Vanstone, E. (2017). *Bridging the gap--Using social media to bring together science and families. Primary Science, 149* ,21-23

Varish & Sharma,D.(2020). *Landscape of social networking sites in schools: An administrative perspective. Indian Journal of Educational Technology,2*(2), 29-40

Wilson, K. L., & Boldeman, S. U. (2012). *Exploring ICT integration as a tool to engage young people at a flexible learning centre. Journal of Science Education and Technology, 21*, 661–668.