

*Full Length Research Paper*

# **Students' transition from face to face learning to online learning at higher education: A case study in Trinidad and Tobago**

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**This action research highlights the experiences of undergraduate students as they transit from face to face learning to online learning at a higher education institution in Trinidad and Tobago. A review of the existing literature within the local context indicated that there exists a dearth of information about the experiences of these students. It is imperative that policy makers pay more attention and consideration to the voices of these students especially when they are formulating policies that pertain to online learning. Consequently, a case study was conducted to carefully ascertain students' experiences during this transition. Fifteen undergraduates participated in this study. Informal structured interviews and semi-structured questionnaires were employed. Data were analyzed with the use of three major thematic headings: Online learning (ONL) is a possible instructional option, Face to Face learning (F2F) is essential for Mathematics and Face to Face learning (F2F) is necessary for human interaction. Recommendations for the use of more ONL education were offered.**

**Key words:** Online education, face to face education, case study.

## **INTRODUCTION**

The transition from face to face learning (F2F) to online learning (ONL) at higher education could be considered a relatively new phenomenon in Trinidad and Tobago. For the purpose of this paper, the higher education institution at which this study was conducted will be referred to as Institution A. Over the years teaching/learning was conducted strictly via F2F although several attempts have been made to introduce ONL. ONL was never fully materialized and the conventional form of learning, F2F

dominated. Several discussions, chiefly among policy makers, regarding the proper execution of ONL continued, and, in January 2020, a pilot programme was implemented. ONL was finally offered in several subject areas. Many were excited about this new teaching/learning strategy and gave it their full support and commitment.

Lecturers and students were strongly encouraged to utilize the new online platform for teaching and learning.

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Many lecturers and students with great enthusiasm continued to support this innovation. Initially there were problems such as: the lack of connectivity, the unavailability of laptops and computers for lecturers and students. In addition, some lecturers and students were unable to adequately manipulate the platform. As time progressed some of these issues were satisfactorily addressed. While ONL continued to stimulate great interest, no one took heed of the voices of students. They began to express their opinions concerning ONL. Students' voices about advantages and limitations of the use of ONL experiences remained unheard. Students began to scrutinize their realities about the shift from F2F to ONL. Listed below are some of their voices:

“Great! Don't have to come to school and spend money on printing assignments for courses. Everything is online.”

“No assignments cost, no laptop cost, or internet cost because I pay for them every month. No added cost for me. For me online is cheaper.”

“Oh well to be honest the class has more interaction compared with online. Lack of communication. There are barriers to communication.”

These voices clearly express the experiences that some students encounter with the transition from Face to Face Learning (F2F) to Online Learning (ONL) at Institution A in Trinidad and Tobago. Their voices are extremely significant since there is a dearth of information about their experiences within the literature in the local context. It is also felt that their experiences must be taken into consideration by policy makers when creating guidelines that govern ONL.

Very often, policies in education, at this institution are implemented with little or no consultation of students. Thus, the principal objective of this study is to allow students to express their opinions freely and honestly. In this way, their experiences could influence and assist policy makers if more programmes are realized through ONL. Hence, this study could help to point a possible way forward especially if more ONL options are offered. Thus, this research carefully investigated the transition of fifteen undergraduates during the semester January to May 2020, at Institution A in Trinidad and Tobago. During this semester lecturers and students actively participated in ONL which was only offered via Google Classroom. Keeping this focus carefully in mind, which is the transition from F2F to ONL, this paper seeks to answer the research question: What are your experiences in the transition from F2F to ONL?

## LITERATURE REVIEW

This literature review chiefly examines the criteria,

associated with F2F and ONL. It begins with an overview of F2F then leads into ONL. It concludes with the purpose of the study.

### Face to face learning (F2F)

Qureshi (2019) and Miles et al. (2018) contended that F2F is a teaching/learning method that enhances the teaching/learning process through interpersonal contact. These interactions can create a support network among students and teachers. Students may feel more comfortable and thus, learn easier in a familiar, traditional classroom setting. They may also access more information and acquire a better understanding of course content materials through these interactions. Kirkup and Jones (1996) offered a similar perspective and claimed that it was quite possible to have this bond of camaraderie between students and instructors in a F2F learning environment. Chen (1997) also supported this perspective and further stated that interactions not only allowed students to assess their own learning but also further assisted them to develop a genuine sense of community among themselves. Moreover, this community and fraternity can sometimes increase their level of confidence, intelligence as well as alleviate problems often associated with learning in isolation. Thus, F2F allows students to have greater scope of learning.

F2F is the more traditional type of learning instruction and it involves the transmission of information from the lecturer to the students (Bandara and Wijekularathna, 2017). It generally occurs in an enclosed physical classroom setting. Classes are conducted daily and may vary from early morning to afternoon and night. A whiteboard is normally placed to the front of the classroom, with furniture to accommodate both teachers and students.

### Online learning (ONL)

One criterion associated with ONL is the delivery of study materials to students over a learning management system (Pozzi et al., 2019), which in most instances, is designed by an external source, for example, Google Classroom. Students are physically separated from instructors and the institution; they are also chiefly responsible for their own learning (Bagriacik, 2019). Depending on the nature of the study or subject area, the session maybe student centered. This depends largely on the content to be taught as well as students' familiarity with the complexity of the subject matter. However, one of the main objectives of ONL is to make the student-teacher interaction more convenient and flexible (Bandara and Wijekularathna, 2017). After careful consultations with lecturers and students, classes are meticulously organized and conducted synchronously at

a time that is convenient to both. They are also recorded and made available so that students could review it at a subsequent time if necessary (Fish and Snodgrass, 2019; Qureshi, 2019). As the foregoing reveals, F2F and ONL have similarities and differences. However, the goal of this study is to ascertain students' experiences as they relate to the transition from F2F to ONL.

## METHODOLOGY

A qualitative approach which involved a case study, informal structured interviews and semi-structured questionnaires was utilized. This action research involves a cyclical process of data collection, reflection, and analysis. Meyer (2000) maintained that the strength of action research lies in its focus on generating solutions to practical problems. It also empowers practitioners, by getting them to actively engage with research. Reason and Bradbury (2008) described action research as an approach that is used in designing studies and it also seeks both to inform and influence practice.

The use of informal structured interviews and semi-structured questionnaires provided a clearer understanding of the experiences of these students. Interviews and questionnaires were carefully chosen because it was felt that they would allow students to speak without inhibition and thus, address the research question: What are your experiences in the transition from F2F to ONL? Four demographic items were used to collect data that answered the research question. These were recorded into categorical variables for further analysis. The selected criteria examined: age range, gender, enrolment status and duration of ONL experiences. Data collection was done through regular and consistent fieldwork. The days and the hours of contact were deliberately chosen to accommodate the students.

### Case study

As noted in the introduction, the principal objective of this paper was to arrive at an accurate and thoughtful insight of the experiences of these fifteen students about their transition from F2F to ONL. Hence a case study was specially selected because it was felt that it could provide a more comprehensive picture, deep insights and would be better to investigate complex issues that were anchored in real-life situations. Case studies are holistic inquiries that seek to investigate a specific phenomenon within its natural setting. They are suitable for description, explanation and exploratory into arbitrary issues. According to Yin (2009), case studies explain, describe, illustrate, and enlighten. Yin (2009) also stated that they are empirical investigations and are chiefly based on knowledge and experience.

Creswell (2018) alluded to the fact that qualitative research is useful because researchers can explore and comprehend in greater detail what respondents convey. In a similar way, Smith (1978, cited in Merriam and Tisdell, 2016) supported that case studies are versatile and dynamic and provides a thorough and detailed examination of a phenomenon. It is also an intensive, holistic description and analysis of a single unit. Thus, Cohen et al. (2018) described it as an inquiry into precise scenarios within a real-life situation.

### Interviews

Interviews are apt instruments for collecting data since they are flexible, and researchers can capture nuances and non-verbal cues. They can probe for better understanding, according to Cohen

et al. (2018). Although interviews are powerful data collection tools, they are time consuming, open to interviewer bias, inconvenient for the interviewee and difficult to maintain anonymity. Bearing this in mind, the interview schedule covered two salient areas: Demographic and Students' Experiences which focused on the financial, educational, social, and psychological aspects of their lives.

Using WhatsApp and Google Classroom the interviewers requested permission from the interviewees to make copious notes of all their statements for the entire duration of the interview. Thus, immediately after interviews, data were transcribed verbatim and analyzed. Creswell's (2018) qualitative thematic data analysis process was used, and the transcribed data was further coded and finalized into themes. This was done with the research question in mind: What are your experiences in the transition from F2F to ONL? Firstly, they were transformed in pen written form to type print transcripts into the Excel (Version 2014). Secondly, they were properly scrutinized, reviewed and thoroughly read to gain familiarity and a noticeably clear understanding of students' responses. Thirdly, they were coded and translated into three themes:

- (i) Online Learning (ONL) is a possible instructional option
- (ii) Face to Face learning (F2F) is essential for Mathematics
- (iii) Face to Face learning (F2F) is necessary for human interaction

### Questionnaires

Miles and Huberman (1994) stated that open-ended questionnaires give students an opportunity to freely express their voices in a dataset. Similarly, Creswell (2018) confirmed that this instrument also allows participants to state their views and opinions objectively and unconstrained by any biases of the researcher or past research findings. They are also cost effective and allow for structured responses. Therefore, open-ended questionnaires were chosen as an apt method of data collection and respondents were assured of anonymity. They comprised dichotomous, Yes/No and questions and some related to their experiences of F2F and ONL. Following the guidelines of Wilkinson and Birmingham (2003) eight questions with specific instructions which could be answered in approximately ten minutes were administered. This was done to minimize the time participants would spend to complete them and hence maximize the return rate.

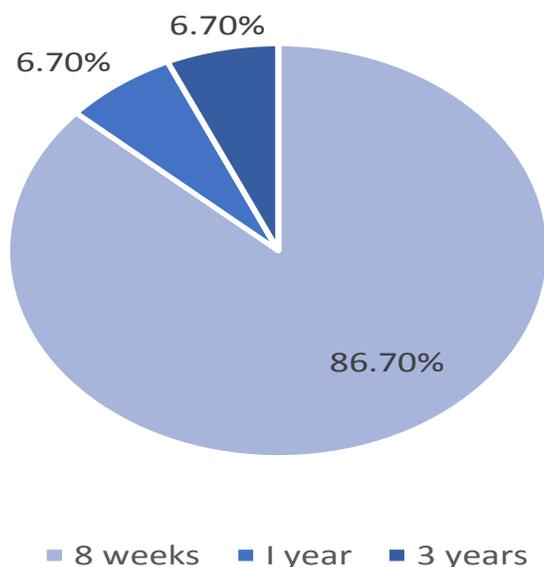
Cohen et al. (2018) together with Leedy and Ormrod (2018) noted that researchers ought to be acutely mindful of the advantages and limitations of the use of questionnaires. In addition, Cohen et al. (2018) cautioned that this instrument does not afford participants the opportunity to explain their responses and the categories may not include all that they might want to say Thus, informal interviews addressed that deficiency and simultaneously served to triangulate data.

### Validity

Creswell (2018) noted that credibility is evident when researchers validate their findings. According to Denzin (1978, cited in Danny (2014)) triangulation is the use of more than one method to gather data, such as informal interviews, and semi-structured questionnaires. Creswell (2012) offered that triangulation is also the process of corroborating evidence from different individuals in descriptions and themes in qualitative research. Similarly, Spaulding (2014) and Walsh (2013) observed that triangulation presents different aspects and a detailed analysis of the research outcome. Triangulation also allowed the researchers to collect and compare various perspectives of the phenomenon so that data presented were valid and free from bias. Triangulation also allowed

**Table 1.** Age Groups, gender, and status of participants.

Age groups (years)	% of population	Females (%)	Males (%)	Full-time (%)	Part-time (%)
Under 19	6.7	0	6.7	6.7	0
20-24	13.3	13.3	0	13.3	0
25-29	33.3	13.3	20	0	33.3
30-34	20	20	0	0	20
40-44	13.3	6.7	6.7	0	13.3
45-49	6.7	6.7	0	0	6.7
Over 50	6.7	6.7	0	0	6.7

**Figure 1.** Duration of students' online experiences.

researchers to optimize credibility. Data for this research were gathered through informal interviews and semi-structured questionnaires.

### Reliability

Pilot and Beck (2014, cited in Connelly, 2016) hold the firm view that reliability in qualitative studies refers to the level of confidence in the data, interpretation, and methods used to support the quality. Additionally, Leung (2015) stated reliability in qualitative research refers to exact replicability of the processes and the results. Thus, to enhance consistency, intercoder reliability was established. A high level of intercoder reliability indicated that both reliability and replicability were present, and these strengthen evidence that the results of a qualitative study were scientifically valid (Kurasaki, 2000, cited in Mac Phail et al., 2016, p. 199). Thus, to ensure a high level of reliability, responses from informal interviews and semi-structured questionnaires were immediately recorded and clearly documented during telephone and Google Classroom conversations.

### The students: Who are they?

According to Table 1, students' ages ranged from under 19 to over

50 years old. The majority of students were 25-29 years old. Most females were within the age group of 30-34 years, while the highest percentage of males was within the age group of 25-29 years. A seemingly unusual combination of both full-time and part-time students, studying within an exclusively part-time class contributed to the vast richness of the data. This enrollment included (80%) part-time and (20%) full-time students. All students had a positive response to ONL. However, they differed for the teaching of Mathematics.

The pie chart illustrates the variety of ONL experiences among students, before they began their programmes of study at this institution. Figure 1 shows that prior to this study, ten females and three male students, a total of 10 students used ONL for eight weeks, while one male studied with the online modality for one year, and another for three years. Males dominated females with years of experiences in ONL. This enhanced the judicious mix of rich experiences described by students in the data collected.

## FINDINGS AND DISCUSSION

Data were collated, analyzed, triangulated, and documented in a narrative form using three thematic headings: Online learning (ONL) is as a possible

instructional option, Face to Face learning (F2F) is essential for Mathematics and Face to Face learning (F2F) is necessary for human interaction. Students also revealed that while they appreciated both forms of learning most of them noted that the teaching of Mathematics ought to be conducted F2F. Recommendations for the use of more ONL education were offered.

Students selected for this study were purposely chosen from one undergraduate class at a tertiary education institution in Trinidad and Tobago; they were readily available and accessible to participate in this study. While this complexity of student-demographic data presented some challenges to analyze and interpret, integrity was maintained. Sometimes the data collected and analyzed were intertwined and this also provided an excellent base for understanding the diverse experiences. The analysis was presented in a narrative form, which reflected its ever-developing nature, the various components of the students' experiences.

### **ONL is a possible option**

While ONL in higher education continues to be an option for students in Trinidad and Tobago there are limitations and advantages. Some limitations associated with this learning are the excessive length of time some students may take to learn in a digital space (Deming et al., 2015) and the inability to interact with peers. Some advantages include the increased access to educational programmes (Montelongo, 2019), the improved students' outcomes and increased accessibility to information (Suresh et al., 2018). Students spontaneously describe some of their benefits:

"Students can study and work at their convenience. Some students even report better concentration in online classes due to the lack of classroom activity."

"Yes, I am - I am! My lecturers are very well informed, and I look forward to learning in a relaxed environment. It is a more relaxed learning experience for me."

Thus, the above-mentioned quotes emphatically illustrated that some students felt that ONL was extremely convenient and comfortable and they experienced minimum stress in completing exercises. This idea is supported by Croxton (2014, p. 1) who stated that: "Online learning holds great appeal to a large number of students because it offers flexibility in participation, ease of access, and convenience."

Other students mentioned that ONL was also economically viable because they did not have to spend money on transportation, meals, and printing assignments. In addition, they also claimed that since most of the classes were recorded, they listened to them at a subsequent time for further clarification. To

underscore the importance of ONL a student carefully stated that it was: "Important that students can often revisit the recording to accentuate clarification. I check the recording and discuss with my peers after class or before the next class." Hence, ONL is valuable because students are better able to use to different platforms for communication, research, and networking. The following views expressed by these three students confirmed the foregoing:

"Yes, I would recommend ONL as it's a valuable source of learning."

"Am I think it is a step in the right direction."

"I know people learn differently but for me ONL works and are preferred by me. I am comfortable with online education."

Davis (2017) compared students' satisfaction with ONL and traditional education. She posits that students preferred the online environment, and that it provided them with more satisfaction. The view expressed by Davis (2017) concurred with findings of this study since students also gave reasons for their preference of ONL over F2F. They stated that studying via ONL was convenient and it helped to reduce expenditure. In addition, the flexibility to subsequently source recordings of classes and revise content also proved to be extremely valuable. Moreover, studying via ONL gave them the opportunity to learn more about technology. They generally preferred ONL and the following statement confirmed the perspective gleaned from a student:

"Convenience and flexibility: Online courses give students the opportunity to plan study time around the rest of their day, instead of the other way around."

At least three students reported that they had no previous orientations to ONL, and this may have caused hindrances to their learning. Burge (2000) stated that persons enter the online learning environment with different skill levels; hence it is recommended that before a student takes an online course, information must be gathered and acted upon before the student is assigned to the Learning Management System. Possessing the necessary computer skills is essential for success in an online learning environment. Therefore, students must have orientation sessions to build their confidence in the use of Learning Management Systems such as Google Classroom before they are assigned ONL. These two students provide this summary:

"I will focus more in class. We need small classes. People have no opportunity to interact like in IR class. Does not allow us to connect. It is boring. I am not learning anything in this class."

“there is no personal teaching interaction between pupil and teacher...if the pupil needs that special attention.”

### **F2F is essential for Mathematics**

Kee (2020) maintained the strong view that interaction is part of the learning experience of adult learners. Further, Mouw et al. (2019) also confirmed this theory in 2019, when they investigated the quality of teacher - students' interaction and Mathematical learning gains. They found that there was a positive correlation between teachers' interactions with students and performances in Mathematics. This constant interaction and engagement of both teachers and students were undoubtedly expressed by these students:

“Limited. I mean I find online not too interactive. I need the interaction. I need a classroom to ask questions for Maths. The online can work for the courses not for Maths.”

“I want to actually see you write the Maths, so it is not the same.”

“Maths is not a subject to do online.”

The experiences of the students expressed above notably indicated that there is great merit when Mathematics is taught in a F2F environment. Moreover, cognition is stimulated, the teaching/learning process is enhanced and ultimately the students benefit. Students specifically mentioned that because Mathematics classes were dynamic, stimulating and actively involved them, cognition was evident:

“Able to understand Maths F2F, it more hands on, and can interact with peers.”

“Ah could talk in class more about it. With Online is very restrictive and does not adequately facilitate the teaching of Maths.”

Classroom interactions extend beyond mere discussion of course content. They include affirmation and motivation by both lecturers and peers. These criteria are absolutely essential since they give students a deep sense of worth and dignity. Moreover, students are encouraged to do their best. The opposite is also true since the absence of these attributes serves as a disincentive. Merton (1948) affirmed this position. He first postulated the theory of self-fulfilling prophecy: forecast an action and it becomes a reality.

Students acutely aware of this theory vividly recalled a particular experience that they encountered during a Mathematics class. They stated that the teacher presented some Mathematical problems to solve. They

were allowed to communicate freely in groups and then write their possible responses on the white board. They also remembered that during the same session the teacher regularly affirmed them and was non-judgmental. As a consequence of this remarkable gesture they were able to maximize their potential. Hence, it was not unusual that these students appreciated this approach to the teaching of Mathematics above all other types of experiences in other courses. Therefore, they unanimously exclaimed that they preferred to study Mathematics through F2F as mentioned by this particular student:

“Decided to discontinue Maths because it is not as engaging as F2F. Maths is too difficult and I really need interaction from the teachers and other students. Moreover, the teacher is better able to motivate and encourage students.”

Krishnan (2014) investigated students' perceptions of the F2F and the online component in a hybrid Mathematics course. His analysis revealed that students preferred the F2F mode and that they understood mathematics concepts better with the F2F instructions” (p. 36). A unique revelation of this study lies in the fact that more than 75% of the participants categorically stated that Mathematics ought to be taught using F2F:

“Maths is not a subject to do online. The only subject I do not like in F2F is Maths. I think I will understand Maths via F2F, it more hands on, I could talk in class more about it with my peers and that makes it easy. The online is less peer talk so I do not understand it as good as in class.”

### **F2F is necessary for human interaction**

“You'll be able to concentrate harder on your learning because there'll be less distraction than if you were at home. You may feel more comfortable and learn more easily in a familiar, traditional classroom situation.”

“Face to face was more fun and interactive. It allowed me to be more participative.”

You and Kang (2014) purported that students who are self-disciplined may favour ONL. In addition, Chaney (2001) stated that ONL is rapidly expanding environment which permits users the flexibility of studying. Croxton (2014, p. 2) further added that: “When students have insufficient formal or informal interaction experiences in online courses, both learning and satisfaction may be compromised.” Bandura (2001) is of the strong view that from a social cognitive perspective, knowledge is constructed and further developed while individuals are engaged in activities. This entails receiving feedback, as

well as participating in other forms of human interaction in public, social contexts. Bandura (2001) further added that since cognition is not considered an individual process, learning and knowledge are shaped by the kinds of interactions a student has with others and the context within which these interactions occur.

On one hand, online education is flexible, engaging and cost effective. On the other hand, there is a serious lack of personal interaction and intimacy with peers and lecturers. Moreover, there is the inability to converse freely. It is also intimidating for those who are shy and innocuous. Thus, F2F is better because it challenges and motivates students to maximize their potential. One student claimed that:

“Since I must literally face the teacher, I was motivated to do the home-work and write the work on the white board. With ONL it is difficult to supervise students but with F2F there is the text, and all can follow the lessons.”

Students also hold the opinion that the physical presence of the lecturers and peers can positively impact others socially, mentally, and educationally. This becomes even more apparent because: “Peers are sometimes reluctant to admit that they do not understand the lecturer, and they are afraid of appearing somewhat inferior.” Moreover, lecturers can often supplement the lack of personal teaching interaction between pupil and teacher especially if the student needs that special attention. A student remarked: “It is bad because I am not motivated because I am home, and I do not have good time management.” Yet another added: “Yes, I am missing group work. Online I am limited and cannot network and get other opinions.” This same student concluded that:

“Everyone logs on to class, then go their own way after class. Does not allow for networking and working with peers which I miss.”

### Recommendations

From all that was stated the following recommendations are suggested:

- (i) Students ought to be given more opportunities to study ONL.
- (ii) Students should be provided with social opportunities during ONL.
- (iii) A blended form of instruction should be given for Mathematics courses.

### Conclusion

The researchers tried as far as possible to keep the focus and thus answered the research question: What are your

experiences in the transition from F2F to ONL? By adequately addressing the research question they presented the experiences of students. Action research afforded them the flexibility to interact informally with these students in their natural environment and it also allowed them to speak freely about their own experiences. The use of a combination of informal structured interviews and semi-structured questionnaires permitted the researchers to maintain validity and readability. Data were collected, collated, triangulated and documented in a narrative form using three major thematic headings: Online learning (ONL) is a possible instructional option, Face to Face learning (F2F) is essential for Mathematics and Face to Face learning (F2F) is necessary for human interaction. Students also revealed that while they appreciated both forms of learning most of them persistently noted that the teaching of Mathematics ought to be conducted F2F. Recommendations for the use of more ONL education were offered.

### CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

### REFERENCES

- Bandara D, Wijekularathna DK (2017). Comparison of student performance under two teaching methods: Face to face and online. *The International Journal of Educational Research* 12(1):69-79.
- Bandura A (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology* 52:1-26.
- Bagriacik YA (2019). Distance and face-to-face students' perceptions towards distance education: A comparative metaphorical study. *Turkish Online Journal of Distance Education* 20(1):191-207.
- Burge E (2000). *The strategic use of learning technologies*. NY: John Wiley.
- Chaney EG (2001). Web-based instruction in a rural high school: A collaborative inquiry into its effectiveness and desirability. *NASSP Bulletin* 85(628):20-35. <https://doi.org/10.1177/019263650108562803>
- Chen L (1997). Distance delivery systems in terms of pedagogical considerations: A revolution. *Educational Technology* 37(4):34-37.
- Cohen L, Manion M, Morrison K (2018). *Research methods in education* (8<sup>th</sup> ed.). NY: Rout.
- Connelly LM (2016). Trustworthiness in qualitative research. *Medsurg Nursing* 25(6). <https://pdfs.semanticscholar.org/b467/089d0422a83fe1d5715d837dd39d9fce4e7c.pdf>
- Creswell JW (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Boston, MA: Pearson.
- Creswell JW (2018). *Research design: qualitative, quantitative, and mixed methods approaches* (5<sup>th</sup> ed.). CA: SAGE.
- Croxton RA (2014). The role of interactivity in student satisfaction and persistence in online learning in Merlot. *Journal of Online Learning and Teaching* 10(2):314.
- Danny G (2014). Triangulation in qualitative research podcast: Short version. <https://www.youtube.com/watch?v=aTEbA2LZalg>
- Davis A (2017). Measuring student satisfaction in online Mathematics course. *Kentucky Journal of Excellence in College Teaching and Learning* 14(2):20-27.
- Deming DJ, Goldin C, Katz LF, Yuchtman N (2015). Can online learning bend the higher education cost curve? *American Economic Review*

- 105(5):496-501.
- Fish LA, Snodgrass CR (2019). Instructor academic factors and their influence on instructor perspectives of online versus face-to-face education at a Jesuit institution. *Business Education Innovation Journal* 11(1):107-117.
- Kee CL (2020). Face to face tutorial, learning management system and WhatsApp group: How digital immigrants interact and engage in e-learning. *Malaysian Online Journal of Educational Technology* 8(1):18-35.
- Kirkup G, Jones A (1996). New technologies for open learning: The superhighway to the learning society? In P. Raggatt R. Edwards, & N. Small (Eds.), *adult learners, education and training 2: The learning society – Challenges and trends* (pp.272-291). London: Routledge.
- Krishnan S (2014). Students' perceptions of learning mode in Mathematics. *Malaysian Online Journal of Educational Sciences* 4(2):32-41.
- Kurasaki KS (2000). Intercoder reliability for validating conclusions drawn from open-ended interview data. *Field Methods* 12(3):179-194. <http://dx.doi.org/10.1177/1525822x0001200301>
- Leedy PD, Ommrod JE (2018). *Practical research: Planning and design* (12th ed.). NJ: Prentice-Hall Inc.
- Leung L (2015). Validity, reliability, and generalizability in qualitative research. *Journal of Family Medicine and Primary Care* 4(3):324. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4535087/>
- Mac Phail C, Khoza N, Abler L, Ranganathan M (2016). Process guidelines for establishing intercoder reliability in qualitative studies. *Qualitative Research* 16(2):198-212. <http://dx.doi.org/10.1177/1468794115577012>
- Merriam SB, Tisdell EJ (2016). *Qualitative research: A guide to design and implementation* (4<sup>th</sup> ed.). San Fran.: Jossey – Bass.
- Merton RK (1948). The self-fulfilling prophecy. *Antioch Review* 8:193 - 210.
- Meyer J (2000). Using qualitative methods in health-related action research. *British Medical Journal* 320:178-181.
- Miles D, Mesinga J, Zuchowski I (2018). Harnessing opportunities to enhance the distance learning experience of MSW students: An appreciative inquiry process. *Social Work Education* (37(6):705-717. <https://doi.org/10.1080/02615479.2018.1447557>
- Miles MB, Huberman AM (1994). *Qualitative data analysis: An expanded sourcebook* pp. 705-717. (2<sup>nd</sup> ed.). Thou. Oaks, CA: Sage.
- Mouw JM, Saab N, Janssen J, Vedder P (2019). Quality of group interaction, ethnic group composition, and individual mathematical learning gains. *Social Psychology of Education* 22(2):383-403. <http://dx.doi.org/10.1007/s11218-019-09482-w>
- Montelongo R (2019). Less than/more than: Issues associated with high-impact online teaching and learning. *Connecting Education, Practice and Research* 9(1):68-79.
- Pozzi F, Manganello F, Passarelli M, Persico D, Brasher A, Holmes W, Whitelock D, Sangra A (2019). Ranking meets distance education: Defining relevant criteria and indicators for online universities. *International Review of Research in Open and Distributed Learning* 20(5):42-63.
- Qureshi JA (2019). Advancement in Massive Open Online Courses (MOOCs) to revolutionize disruptive technology in education: A case of Pakistan. *Journal of Education and Educational Development* 6(2):219-234.
- Reason P, Bradbury H (2008). *The SAGE handbook of action research: Participative inquiry and practice* (2nd ed.). London: SAGE.
- Spaulding DT (2014). *Program evaluation in practice: Core concepts and examples for discussion analysis* (2nd ed.). San Fran., CA.: Jossey-Bass.
- Suresh M, Vishnu PV, Gayathri R (2018). Effect of e-learning on academic performance of undergraduate students. *Drug Invention Today* 10(9):1797-1800.
- Walsh K (2013). When I say...triangulation. *Med. Edu.* 47(9):866. <https://onlinelibrary.wiley.com/doi/full/10.1111/medu.12241>
- Wilkinson D, Birmingham P (2003). *Using research instruments: A guide for researchers*. New York: Routledge. Falmer.
- Yin R (2009). *Case Study Research: Design and methods* (4<sup>th</sup> ed.). Thousand Oaks, CA: Sage Pub.
- You JW, Kang M (2014). The role of academic emotions in the relationship between perceived academic control and self-regulated learning in online learning. *Computers and Education* 77:125-133. <http://dx.doi.org/10.1016/j.compedu.2014.04.018>