

Flipped Classroom And Digital Classes In Morocco: Experience Quality Educational Digitization With Ease

By

Hommane Boudine

Geosciences Laboratory, Faculty of Sciences, Ibn Tofail University, Kénitra, Morocco

Email: hommane.boudine@gmail.com

Meriem Bentaleb

Geosciences Laboratory, Faculty of Sciences, Ibn Tofail University, Kénitra, Morocco

Khalid Mrigua

Laboratory of Electronic Systems, Information Processing, Mechanics and Energy, Faculty of Science, Ibn Tofail University, P 133, 14000, Kenitra, Morocco

Mohamed Tayebi

Geosciences Laboratory, Faculty of Sciences, Ibn Tofail University, Kénitra, Morocco

Email: motayebi@gmail.com

Abstract

After the global health crisis caused by the coronavirus COVID-19 pandemic, a digital transformation accelerated in all sectors as a transitional solution to sustain educational continuity. In this context, new teaching practices and approaches were adopted at the beginning of 2020 to ensure fairness and equal opportunities between learners.

In this framework and to analyze the association of e-learning and face-to-face teaching, this study focuses on the manipulation of information and communication technologies in education (ICT) to support alternation learning, as well as the evolution of digital pedagogy, which has become one of the most appropriate forms of learning for various social groups (disabled, refugees...) and in different circumstances (war, pandemic...).

This situation has given way to pedagogical innovations in schools to remedy the lack and make the student active in a digital learning process. This study focuses on evaluating teaching by the flipped classroom method. It makes it possible to avoid the obstacles that hinder learners' motivation in the face of this pedagogical type by focusing on integrating new technologies. The teacher can present the course through the digital tool, using an educational platform, allowing each student to learn and evolve at their own pace without losing learning motivation.

Keywords: E-learning, educational platform, COVID-19, flipped classroom, digital classes.

1 Introduction

In early 2020 the spread of the coronavirus covid19 pandemic worldwide and the pressures experienced by the health crisis implied a change in the context of education in all countries.

Faced with the challenges of the spread of the pandemic and following preventive health measures, the Moroccan education system has shown flexibility and adaptability by

making a magisterial transition based on ICT and pedagogical platforms to support distance learning, promoting active learning models and the most collaborative pedagogical innovations [2].

To manage this situation, the Ministry of National Education has adopted a hybrid pedagogical model during the 2020-2021 school year that alternates between distance and face-to-face teaching.

At the start of the school year 2021-2022, the Ministry of National Education, Preschool and Sport declared that the educational model adopted by schools must combine distance and face-to-face teaching based on digital tools and educational platform developed by the Department of National Education, with the support of the Millennium Challenge Account Morocco [23]-[24]-[25].

In March 2021, three new applications were launched by the Minister. These applications, which can be downloaded from the Ministry's official website (www.men.gov.ma), offer a new and user-friendly tool that will contribute to promoting the education system and strengthening ties between the different actors of the school community.

This study focuses on the project of digital classrooms launched by the Ministry of National Education, Preschool and Sport in 2023 and the impact of the association of flipped pedagogy on the learning process and pedagogical techniques that we can adopt to achieve a digitalization of quality teaching/learning based on pedagogical platforms and intended for the various types of students.

What are then the pedagogical methods we can use to succeed in this new approach, and what is the influence of mobile applications on the learners on the one hand and the teacher on the other? How can we train and acquire new skills when we do not have the time or the possibility to travel? [16]-[17].

Based on the experiences of other teacher-researchers around the world [12] [15]-[16]-[17]-[18], this research is based on the performance of digital classrooms on learning as well as the added value offered by the combination of flipped pedagogy to achieve the following objectives:

- Optimize the performance of self-education and e-learning.
- Motivate students with pedagogical innovations by introducing digital tools (tablets, phones, computers...) in the educational process to individualize learning.
- Discover the taste of school with digital tools.
- Support the learner's autonomy of learning through distance learning orientation.
- Motivate all students in the class to develop the course in a collective manner without exception.

Digital educational tools:

Most studies have explored the effects of telematic smartphone use and academic performance using reported course self-noting [3]-[6]-[7]. According to Parent, G. & Paquin, A. [4], the loss of student motivation affects learning performance. Students drop out of school because they lose the taste for studying, which shows a strong relationship between loss of motivation and dropout in the educational scene. This loss of motivation is related to the school, and the course provided [5].

Many studies have examined the relationship between cell phone use and academic performance. Many such studies have yielded mixed results, showing that the unregulated prevalence of smartphones in our society, excessive use, and even addiction have become a significant global problem [7]-[22]-[26]. This new situation implies adapting the learning process to monitor and accompany learners in their handling of information and communication technologies (ICT) [2].

The flipped Classroom.

Lately, we have noticed that the learning activities carried out by the learner in the traditional classroom (reading or even listening and copying from the blackboard) are generally demotivating for them on the one hand, and it takes much time on the other hand. In addition, the learner is faced with activities to do at home (exercises, research, retake the course...), which can be difficult for them, Influencing learning performance [5]-[6]-[7]-[12]-[20]-[21].

This experiment aims to gather information about the influence of digital classrooms on students by comparing before and after grades (C. Caroline) [10]-[3]. The time devoted to the course by applying the flipped classroom is reduced, so the place and role of the teacher change, and it becomes possible to spend more time in class to do simulations, exercises, and complex tasks.

Flipped classrooms are not just "video lectures before the session and exercises and applications during the session". It is also an upheaval in the relationship to knowledge and the roles held by students and teachers [9]- [8]-[11]-[26].

2 Materials And Methods

2.1. Study location and population:

The present research is the result of a study conducted in Morocco that focuses on the influence of the combine between digital classrooms project and the flipped classroom on students' learning in the last year of the college cycle at ALYASSAMIN college in Sidi Slimane. The students of the class concerned by the experiment have an average age of 14 years (57.5% female (17)) in a class of 33.

2.2 The digital environment:

Under the direction of the program GINIE, DSI, DC, and SNIP, the digital classroom project aims to strengthen the teaching of science in the college by manipulating digital tools. It is to provide teachers with a learning management platform in the disconnected mode that allows them access to the educational scenario developed and DNL course paths. Thus, offering a digital environment adapted to the needs of students:

Technology and digital tools:

- Available equipment (SMM and/or VMM): Aref (TTH): 23 rooms.
- Tablet equipment: 6000 donation tablets and one WIFI router per facility.

Training:

- 1st session : training of trainers and inspectors.
- 2nd session : Training of teachers of Math, SVT and PC

Using the flipped classroom can be the solution pedagogy because it reverses the nature of learning activities between class (listening, reading, copying...) and at home (exercises, research...), requiring a digital medium.

2 Method

The project of digital classrooms in schools aims to support teaching with digital tools to reinforce the learning of science subjects.

The first step is to list the students and add them as users, from which they will get a username and password to access the site freely.

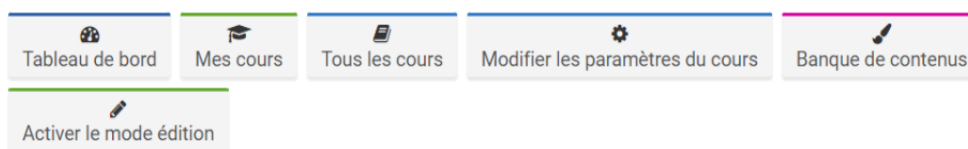
- On the home page, click on site administration
- The second part is to choose by clicking on "user."
- On "add a user," click for the second time.
- A new Get page contains empty boxes.
- These boxes contain information to be filled in concerning the user that we will add, such as the name, the first name, the username, the password, and the email address...

Step 1: access a course.

- Access the "https://cmcf-tice.com" platform with a teacher account.
- Go to: Tableau de bord > Profile.
- Check the course profiles.

Access a course with a "Digital Classroom Teacher" role.

Check the Menu:



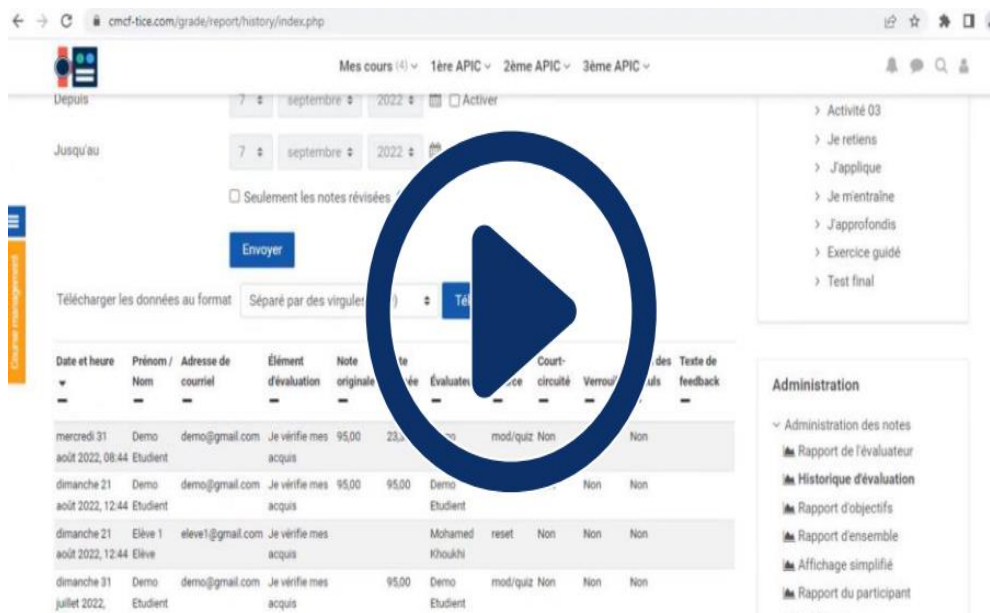
- Go to: je me teste / je vérifie mes acquis / Summary of your previous attempts
- Display the notes and then reread the attempts.

Depending on the conditions of each training centre, the beneficiaries should be divided into groups, and a teacher of the digital classroom and students should be designated in each group, and then the roles should be reversed.

- Access the " https://cmcf-tice.com " platform with a student account.
- Go to: Tableau de bord > Profile
- Check the course profiles.
- Access a course with a "Student" role
- Check the Menu:

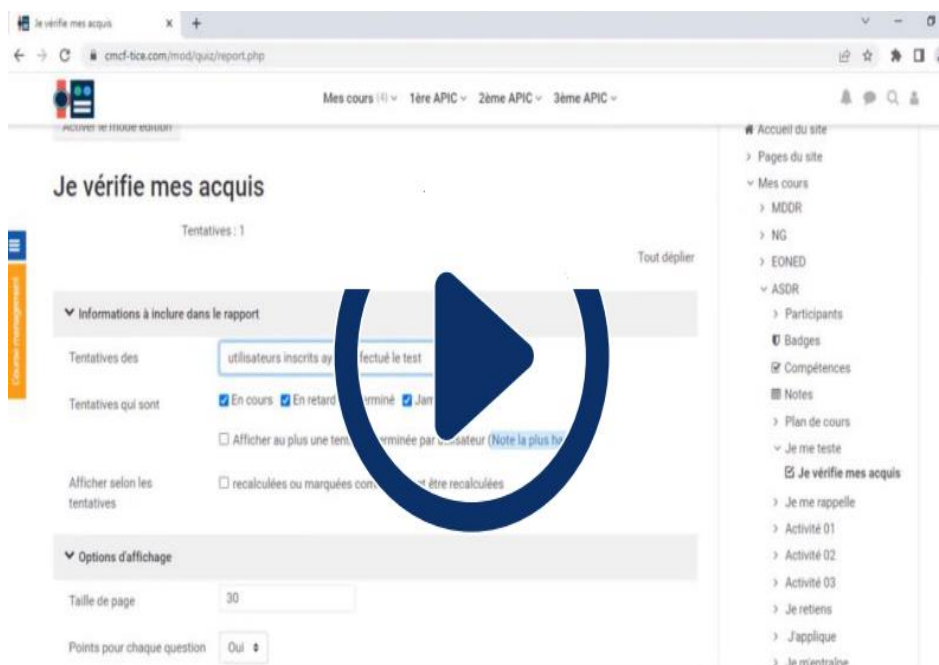


- Go to je me teste / je vérifie mes acquis



To delete a quiz attempt, follow these steps:

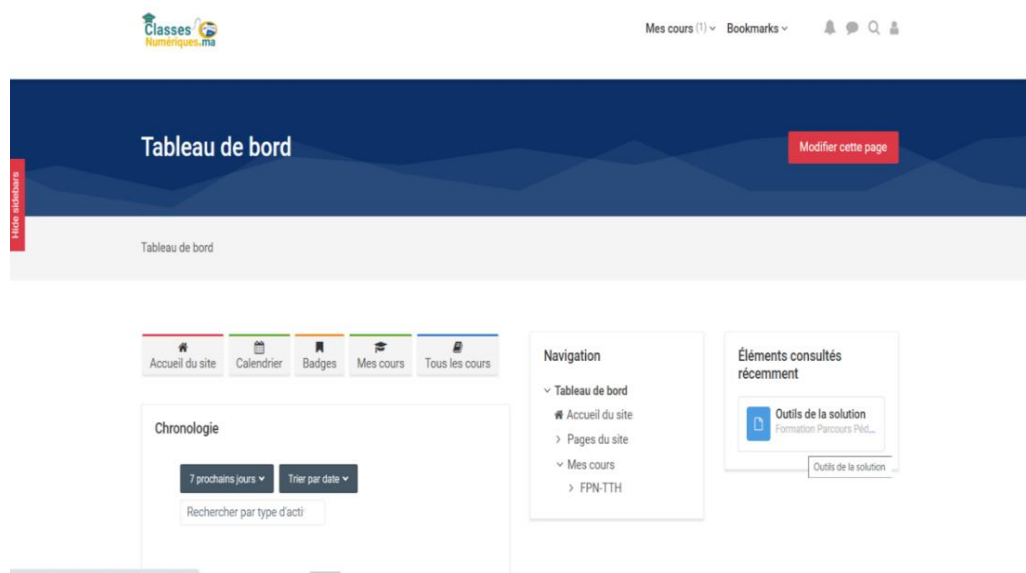
- Access the "https://cmcf-tice.com" platform with a teacher account.
- Repeat the same tasks as in the video.
- Discover the menu: Administration > Grades administration



To view the notes:

- Access the "https://cmcf-tice.com" platform with a teacher account.
- Repeat the same tasks as in the video.

Save the settings by clicking the Save and Return to Course buttons at the bottom of the page.



Teachers can use their features to create pathways such as information, resources, and content in different formats (recordings, documents, videos, presentations, links) [13] (Kiran, R) [18]. They can make these courses open access to the students that he chooses according to the targeted pedagogical objectives and the difficulties encountered by the students. The students access the systems, carry out the work proposed by the teacher, exploit the resources, take questionnaires, and then return to the teacher's documents, recordings, and work.

Results

In the first stage, the flipped classroom pedagogy has advantages that can be considered compatible and remediate the strategy of digitalization of learning for a range of obstacles that hinders the reinforcement of learning of scientific subjects and the autonomy of the student in their handling of resources cited in a digital space. The learner becomes a knowledge holder.

- Students have more time to understand concepts at home and come to class with questions.
- Students are satisfied that they know the content of the session in advance.
- Weaker students are more supported.
- The flipped classroom strategy promotes student autonomy.

We find that in all these phases, the digital tool is a support to diversify the practices, the productions, the consultation to the data, to facilitate the exchanges of information, to differentiate, and to regulate each student's learning. Students become producers and can share and propose resources and thus add and sort data [9]-[19]-[20].

This model of combining flipped pedagogy and digital classrooms has influenced educational performance and parental intervention. A survey was conducted to understand the thinking of learners and their parents.

The following two questions were open-ended, to list the activities that had most affected them during the year. First, positively, and then negatively:

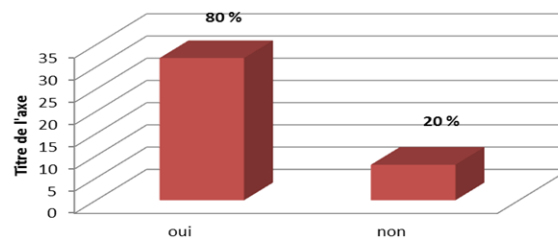


Figure 1: Represents the percentage of students who found themselves motivated to watch video lectures at home.

Do you find the motivation to view the course as a video capsule at home?

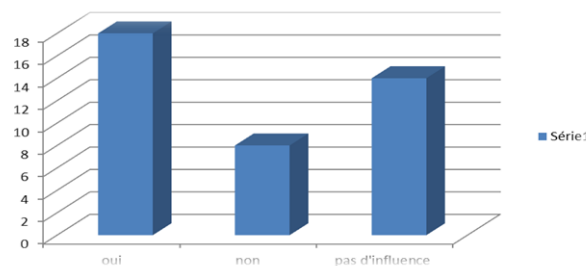


Figure 2: How have your parents responded to this mobile learning model

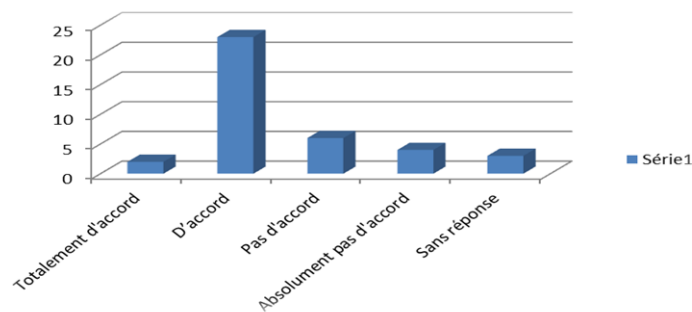


Figure 3: Do you find the flipped classroom compatible with this digital learning model?

According to the questionnaire dedicated to teachers:

- Each student's individual progress according to his rhythm to understand courses.
- It isn't easy to apply this pedagogical model in languages
- In math, it is possible because the exercises require considerable face-to-face explanation.
- It would take time for students to work through all the subjects.
- Some teachers cannot work with students using this method because there are subjects where you must learn by heart, and the assessment has to be written by the teacher...

Students say:

- This method would facilitate learning in most subjects and allow for more group work because of the parent's involvement.
- Practicing in class and seeing the course in video form at home (the flipped classroom) is more motivating than traditional methods.

- It allows us to see the lesson several times with the teacher's explanation
- More exercises in class
- It encourages us to prepare the lesson in advance
- The capsules should be easy to understand the course (not complicated).
- We would like to generalize this practice. It is like watching a movie!
- That helps us to retain the course.

Difficulties envisaged at the time of the session:

An array of questions was asked at the beginning of each session to cite the difficulties and obstacles encountered:

- Did you view the course at home?
- If so, how many times did you view it?
- Did you understand the course?
- Did you encounter any problems?
- Connection problem
- Could not launch the course

Students focus only on the technical difficulties, such as mastering the applications, and the power of having to train alone and in a hurry. The group work also caused some trial and error related to the arrangement of the tables, the room's surface, the students' distribution, and the teams' constitution teams.

The digital classroom is seen as a revolution in schools. Gone are the days of the chalkboard and its chalk! We are now talking about interactive touch screens for learning at school, for example. Indeed, one of the most pleasant uses of digital technology in the classroom remains in the numerous possibilities it offers, such as proposing different and varied content. So which computer equipment should you choose for your school? Several choices of digital tools give teachers a certain freedom and autonomy in the presentation of lessons to be addressed in class. They can use a tablet or a laptop while relying on a visualizer. The choice of software is also essential. Choose those recommended by the Ministry of Education and teachers' associations.

The student who cannot understand the course quickly has the time to review it several times at his own pace in the form of a video capsule.

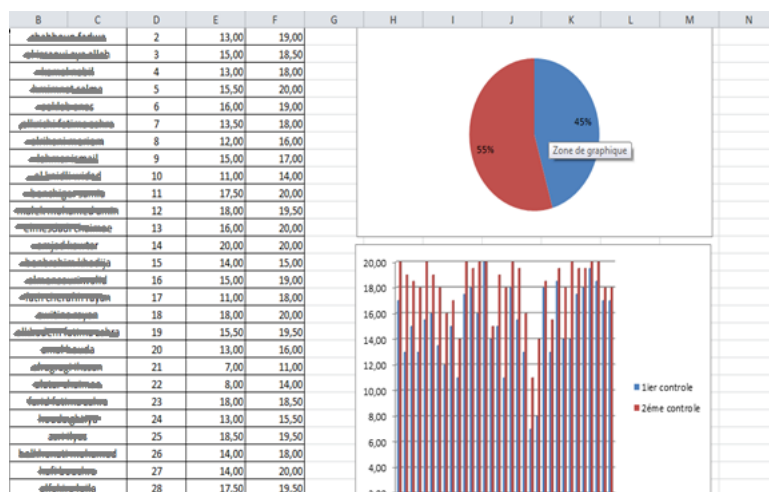


Fig. 18. Students' grades before and after the experiment

1-2- Challenges and obstacles:

To cite the difficulties and obstacles students encountered, I asked direct questions at the beginning of each session:

1. Did you view the course?
 2. If so, how many times did you view it?
 3. Did you understand the course?
- Any problems encountered?
- No computer, tablet, or smartphone
 - Could not download the video
 - Could not launch the course.

According to the survey, many teachers need help to work with digital and computer equipment and create their ENT (digital workspace).

Many students need the possibility to have a computer or tablet because of their family situation.

Practising teaching with digital classrooms requires moving in the class to help students, which implies innovative pedagogical strategies (the flipped classroom).

3 Conclusion

Combining the flipped learning strategy with the digital classroom model has many advantages. It allows the teacher to practice his profession positively and get acquainted with his students in a new way by integrating the parents.

This study has shown that it is time to use smartphones in the classroom as a pedagogical tool, benefiting from their multiple advantages. Still, the main one is the possibility of being autonomous in front of this digital learning process.

- Students can "live" experiences in class and have rich exchanges with the teacher and other students. They are no longer forced to sit in silence for hours.
- Students can quickly adapt to digital classroom practice.
- Eliminate several barriers due to student behaviour.
- Unify the learning level of learners.
- Parents can be involved in the learning process to become familiar with their students.

Practically, this flipped classroom pedagogy model gives excellent energy to the students to provide more effort, and they became more interested in learning and the advantages of these innovative methods. But there is still a long way to go before talking about a global digitalization of teaching-learning in Morocco, and the teachers are not all up to date with the worldwide change within education.

For these reasons and many others, the digitization of teaching using digital classrooms is undoubtedly the most effective strategy to support education in different circumstances (health crises, war or displacement problems, ...). This is an interesting philosophy that should be implemented in the new learning reform and in-service teacher training.

References

- Maria Drolia, Mobile Learning Applications for Refugees : A Systematic Literature Review, *Educ.Sci.* 2022, 12, 96.
- P. Prignot, Classe inversée et élèves de l'enseignement secondaire : d'une perspective technologique à une approche anthropologique. *Education*. Université de Strasbourg, (2019).
- J'érôme Hutain, Nicolas Michinov :Improving student engagement during in-person classes by using functionalities of a digital learning environment
- Ait Moussa Abdelaziz, L'impact de la méthode inversée sur un cours d'informatique : une étude de cas à l'université d'Oujda, (2016).
- G. Parent, & A. Paquin, Enquête auprès de décrocheurs sur les raisons de leur abandon scolaire. *Revue des sciences de l'éducation*, (1994).
- Oluwafemi J. Sunda, The effects of smartphone addiction on learning: A meta-analysis,
- M. Guilbault et A. Viau-Guay, La classe inversée comme approche pédagogique en enseignement supérieur : état des connaissances scientifiques et recommandations, *Revue internationale de pédagogie de l'enseignement supérieur*, (2017).
- ROY-WSIAKI Geneviève N, GRAVEL Nicolas R, PONGOSKI Maria L, « Évaluation de la plateforme pédagogique Simple Steps : une ressource d'intervention accessible et inclusive pour le TSA », *La nouvelle revue - Éducation et société inclusives*, 2022/1.
- R. Bentaibi, flipped classroom : an innovative and revolutionary pedagogy of learning. *International Journal of Advanced Research* (2018).
- D. Leclercq & M. Poumay, Le Modèle des Evénements d'Apprentissage/Enseignement LabSET-IFRES-ULg (2008).
- C. Caroline, V. Bruno, La pédagogie inversée : une évaluation de son efficacité sur les résultats scolaires et sur l'intérêt des étudiants, (2018).
- Marcel Lebrun. Classe inversée oui mais... Quoi et comment ? Pourquoi et pour quoi ? (2016).
- H. Ratompomalala et J. Razafimbelo, Images numériques : simulations et vidéos : Quels apports pour l'enseignement apprentissage de la physique ? (2019)
- M. Lahchimi, La réforme de la formation des enseignants au Maroc, *Revue internationale d'éducation de Sèvres* (2015).
- Guo, H., Tang, R., Ye, Y., Li, Z., He, X. (2017). DeepFM: A Factorization-Machine based Neural Network for CTR Prediction. arXiv e-print.
- Hug, N., (2020). Surprise – A Python Library for Recommender Systems. Ilin, I., Chikin, V., & Solodskih, K. (2018). Recommender Systems with Deep Learning Architectures". *Towards Data Science*.
- Jannach, D., Zanker, M., Felfernig, A., & Friedrich, G. (2010). *Recommender Systems an Introduction*. Cambridge University Press.
- Keras. (2022). *Keras – The Python Deep Learning API*.
- Kiran, R., Kumar, P., & Bhasker, B. (2020). DNNRec : A novel deep learning based Hybrid Recommender System. *Expert Systems with Applications* (Vol. 144).
- Konstan, J. A., Miller, B. N., Maltz, D., Herlocker, J. L., Gordon, L. R., & Riedl, J. (1997). Applying collaborative filtering to usenet news. *Commun of ACM*, 40(3), 77–87.
- Konstan, J. A., Riedl, J., Borchers, A., & Herlocker, J. L. (1998). *Recommender Systems : A GroupLens Perspective*. AAAI Technical. Report.
- Konstan, J. A., & Riedl, J. (2012). *Recommender systems : From algorithms to user*
- Fredrickson, B. (2016). *Faster Implicit Matric Factorization*, Blog.
- Frederickson, B. (2017). *Implicit 0.4.0 Documentation*.
- Funk, S. (2006). *Netflix Update : Try this at home*.

Ghazantar, M. A., Prigel-Benett, A. (2010). A scalable accurate hybrid recommender system. In : the 3rd International conference on knowledge discovery and data mining (WKDD 2010), IEEE Computer Society, Washington, DC, USA.

Ministère de l'Éducation du Québec (2020), Référentiel de compétences professionnelles : Profession enseignante. Page 43