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Issue ***12*** of ***Revue ITEC***, entitled **"*Inclusive Education and Innovative Technologies,"*** brings together a collection of scholarly contributions that explore emerging approaches, policies, practices, and innovative technologies that contribute to creating more inclusive, accessible, and learner-centred educational environments. At a time when educational systems are undergoing profound transformations, the intersection between inclusion and technological innovation has become increasingly significant.

Inclusive education extends beyond ensuring access to learning; it encompasses the creation of equitable educational environments that recognise learner diversity, reduce barriers to participation, and respond to different needs, abilities, and backgrounds. At the same time, the rapid development of digital and emerging technologies is creating new possibilities for enhancing teaching and learning, expanding access to educational resources, and responding to diverse learner needs.

The contributions in this issue address a range of topics, including inclusive education, special needs education, innovative pedagogies, teacher education and professional development, as well as the role of emerging technologies in expanding learning opportunities and addressing the diverse needs of learners. Collectively, the articles underscore the importance of combining pedagogical innovation with inclusive practices to promote equity, active participation, learner empowerment, and lifelong learning.

By bringing together perspectives from different disciplines and educational contexts, **Issue 12** seeks to contribute to current discussions on how innovation and technology can be harnessed to address contemporary educational challenges and foster more inclusive and learner-centred educational environments.

Scenario-Based Learning as a Tool for Student Engagement in Higher Education

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Abstract

Student engagement and active learning are widely regarded as prerequisites and the basis for any classroom in higher education. For a level that requires learning skills, an instructional framework that should be effective is Scenario-Based Learning. SBL offers students scenarios to explore the application of their knowledge by practicing decision-making and problem-solving. This study examines the role of SBL in enhancing university participants' involvement by integrating task participation into traditional instructional activities. A mixed-methods approach was employed by combining a questionnaire with classroom observations to examine students' motivation, interaction, and SBL perception. Descriptive analysis of quantitative data was followed by observational data to assess students' behavioural participation. The findings indicate that SBL has a substantial impact on the educational process through interactive environments. It is mainly carried out through discussion and problem-solving. Scenarios used in a class environment encourage students' investment in lessons and increase their belief in the value of participation in learning. Observation data further showcased higher levels of collaborative problem-solving during SBL than in traditional lecture-based instruction. The most prominent implication suggests that SBL provides an effective instructional framework for developing students' involvement and participation, and for instructors to create interactive and learner-centred classrooms.

***Keywords*:** Scenario-Based Learning, student engagement, higher education, innovative teaching methods, active learning, classroom interaction

1. Introduction

1.1. Background of the Study

A phenomenon often encountered in university classrooms is that meaningful learning depends on more than just physical presence. It requires cognitive and social participation. In many university classrooms, students are passive listeners who attend lectures, take notes, and respond only when prompted. This passive learning is widely reported in higher education and is indeed a poor motivator and a barrier to understanding. Consequently, higher education institutions have adopted active learning techniques. One model rising in popularity is Scenario-Based Learning (SBL). SBL is a teaching approach that engages students in real-life problem-solving scenarios. Rather than passively receiving data from the teacher, students should think, make decisions with their peers, and work with other students to solve a problem.

1.2. Problem Statement

To address this issue, educators encourage students to work together, share ideas, and collaborate to solve real-life problems, specifically through the introduction of more active teaching strategies. Although studies to date have reviewed the effectiveness of SBL in

increasing student participation, the body of literature remains limited in the context of Moroccan higher education. Addressing this gap, the present research aims to determine whether students' motivation, participation in the classroom, and overall learning experiences would improve with the implementation of SBL at the Faculty of Sciences at Mohammed First University of Oujda.

1.3. The purpose and scope of the study

The main objective was to assess the extent to which SBL integration into the conventional curriculum increases students' participation and involvement. To achieve this objective, a mixed-method approach was employed through blending questionnaires with classroom observation data. Both sets were analysed to contextualize SBL and to demonstrate how it introduced change in these sessions.

1.4. The research questions and Hypothesis

The study was guided by the following research questions: To what extent does SBL increase student motivation and engagement compared to traditional lecture-based instruction? How does SBL affect student-to-student interaction and voluntary participation in the university classroom? How do students perceive the usefulness of SBL as a learning method? The three questions tested the following hypothesis: students who participate in SBL activities will show higher levels of responsiveness, participation, and classroom interaction than students who learn through traditional lectures. To answer the research questions and verify the hypothesis, this study was divided into various sections. The first section includes a literature review, followed by research methodology, data analysis, a discussion of findings, and a concluding section with recommendations.

2. Literature Review

2.1. Theoretical Foundations of SBL: Constructivist Perspectives

The SBL pedagogy is rooted in the constructivist theory that views learners as far from being mere recipients of knowledge but rather active constructors of it. From this perspective, students learn by interpreting experiences and reflecting on their decisions. Critics suggest that learning occurs by making choices through SBL as it offers realistic scenarios where students experiment with how such a process takes place. Vygotsky's concept of the Zone of Proximal Development (ZPD) suggests that learning is enhanced through interaction with "more capable peers" and facilitators (Powell, 2009). As a result, the SBL's framework switches the instructor role from information source to learning facilitator.

2.2 Experiential and Situated Learning: Linking Theory and Practice

For Scenario-Based Learning to function well, it should be "situated" in a setting that is significant to the prospective professional self-concept of the learner. Thus, experiential learning involves constructing knowledge and meaning through real-world experience (Yardley et al., 2012). In this context, learning can be most powerful through authentic, practice-based experience. It also prevents 'practice shock', which is the cognitive and emotional dissonance that arises from the confrontation between the idealistic worldview that students have in class and reality in the workplace (Yardley et al., 2012). In the same vein, Lave and Wenger (1991) aptly add the argument of 'situatedness' through LPP. It denotes that learning is about being part of a community of practice. Students move from the peripheries of their field to the centre

of mastery through exposure to scenarios that imitate professional dilemmas. The key to this transition is the use of stories, which are referred to as packages of situated knowledge. By integrating such realistic stories into the curriculum, SBL provides learners with virtual practice with professional experiences and practice situations, so that students can not only establish competence but also identity through these simulations. The review conducted by Alharbi et al., (2024) interestingly underlines this by showing that SBL substantially improves both learning and the development of new skills, especially in clinical and high-stakes settings. Thus, SBL offers a safe environment in which to simulate real-life situations for students, which is particularly important in these areas, ones requiring practical use of difficult skills.

2.3 Teacher Agency and Innovation in the Curriculum

The practice of SBL in higher education often requires teachers to practice pedagogical agency. The adaptation of traditional courses into learner-centered environments implies a curriculum innovation that often stems from the conventional policy on the ground. For students, these instructors create original course materials based on their professional backgrounds and aspirations to design lessons more closely aligned with students' interests (Bascia et al., 2014). Previous research also supports the relationships between student motivation and classroom participation when instructors adopt active learning strategies. Empirically, this is evident in Stone (2012), which demonstrates a correlation between students' participation and attendance, as opposed to the direct lecture format. In Stone's (2012) research, biology students reported positive experiences with active, task-based learning.

2.4 Behavioural Dynamics: Activating Passive Learners

One of the major weaknesses highlighted in SBL is the passive learner problem. Research by Freeman et al. (2014) consistently demonstrates that lecture-based sessions limit critical thinking and knowledge application. Active learning, through SBL, seeks to overcome these limitations by encouraging collaborative drills and problem-solving activities. By eliminating this passive listening mindset, SBL creates a classroom culture in which students are willing to actively participate and communicate. While Freeman et al. (2014) highlight the limitations of passive learning, Clark et al. (2020) specify that task-based approaches are better than performance-based grading from a behavioural economics perspective. University students suffer from present bias as a kind of procrastination in which the immediate cost of effort exceeds the future benefit of a good grade. The vital outcome of Clark et al. (2020) study is that task-based goals serve as a commitment tool for students to address self-discipline issues.

2.5 Effect on Self-efficacy and Readiness for Professionalism

Another important benefit of SBL is its effect on learner confidence. Bardach et al. (2021) conducted a proof-of-concept study showing that SBL interventions significantly increased placement self-efficacy and emotional classroom readiness among pre-service teachers. Self-efficacy, defined as the belief in one's ability to achieve a desired outcome, has strong predictive power for later professional effectiveness. SBL provides a forgiving environment where students can fail yet receive expert feedback. It is what Bardach et al. (2021) accurately describe as a delicate calibration of confidence and actual capabilities. A helpful feedback loop is created when instructors and students interact. Teachers guide the situation, while students decide what to do. Instructors review their choices, which provides students with constant situational assessment and decision-making. This evidence supports that SBL is an adequate teaching practice that promotes participation through active, authentic learning experiences.

3. Methodology

3.1. Sample / Participants

The study was conducted at the Faculty of Sciences UMP, targeting 30 undergraduate within classroom courses. It included 30 students through purposive sampling. The selected participants enrolled in courses that followed traditional lecture-based instruction. In the span of three weeks, the SBL module was introduced to replace traditional lecture sessions. Adhering to the learning curriculum framework suggested by Lave and Wenger, the sessions were designed to mirror realistic professional challenges that students could encounter in their future professional endeavours (Yardle et al., 2012).

3.2. Instruments

The research employed a mixed-methods approach involving two datasets, measuring contribution, interest, and motivation. The first instrument was the questionnaire, which contained 12 items administered on a five-point Likert scale (1=strongly disagree, 5=strongly agree). The questionnaire was divided into four parts: Section A measured Student Engagement Q1-Q4; Section B assessed Participation and Interaction Q5-Q7; Section C measured the learning Experience Q8; and Section D measured Overall Participation Q11-Q12. Based on the literature on student contribution and learning-by-doing in higher education, the SEQ was developed by the researcher and reviewed by two university instructors for content validity. Before administering the questionnaire to all respondents, it was piloted on a small group of students to verify its relevance and clarity.

The second instrument was in the form of a Classroom Observation Protocol. It consisted of a structured observation sheet on which student-to-student interactions and voluntary contributions were recorded. The observable indicators were structured through a Behaviourally Anchored Rating Scale (BARS) developed for this study. Scores ranged from 1 (very low engagement) to 5 (very high engagement). The higher the score, the greater the indication of participation, collaboration, and active participation levels. The frequency of the indicators was recorded through the three sessions with both traditional and SBL sessions to compare students' behavioural changes across different contexts.

3.3. Data Collection and Analysis

Quantitative data were collected from the Faculty of Sciences at UMPO through three classroom sessions. The two SBL sessions were preceded by a traditional session. During the SBL sessions, students worked together to solve problems related to the course material. The researcher observed and documented observable indicators. All students completed the SEQ to assess their perceptions of their learning experience. To identify trends in student perceptions, data from the questionnaire were analysed descriptively using means and standard deviations.

Classroom observation data were analysed using frequency counts and averages, and we compared class participation levels between lecture-based and SBL classes. Based on these numeric markers, qualitative field notes were created and coded thematically to provide contextual information on learner commitment and active contribution behaviours. Ethical considerations were especially taken into account throughout the whole study. Participants were made aware of the research objectives. Their participation was voluntary, and all the responses were treated confidentially.

4. Results

4.1. Questionnaire Results

After the SBL sessions, all 30 participants completed the student questionnaire. Our results are reported by section, with mean score and standard deviation. A mean score of 4.00 or higher on a 5-point scale is considered positive, indicating agreement with the item overall.

Table 1
Descriptive Statistics for Student Engagement

Section	Focus	Mean	SD	Interpretation
A (Q1–Q4)	Student Engagement	3.88	0.70	Positive
B (Q5–Q7)	Participation & Interaction	4.17	0.67	Positive
C (Q8–Q10)	Learning Experience	4.26	0.63	Positive
D (Q11–Q12)	Overall Perception	4.28	0.67	Positive
Overall	All Items	4.11	0.69	Positive

Descriptive statistics indicate that Section A, student investment, had an average of 3.88, SD = 0.70. It was the lowest of the four sections but still above the neutral midpoint of 3.00. For each item individually, Q1 "The scenario-based activity made the class more interesting" had the highest mean on this section = 4.07, while Q4 "I felt motivated to contribute my ideas during the activity" had the lowest. The participation and interaction section B had a mean of 4.17, SD = 0.67. Among the highest-scoring items were Q5 “The scenario activity encouraged interaction between students” at 4.33, followed by Q7 “The activity encouraged discussion among students” at 4.27. This indicates that it was clear to students that SBL facilitated peer interaction. Next up was Section C, which measured the learning experience and had the second-highest mean, M = 4.26, SD = 0.63. Q9 “The activity helped me apply the lesson in a practical context” scored the highest mean of 4.43 for this section. These numbers imply that SBL was valuable as a tool to mimic real-world situations in the classroom. SBL’s overall perception in Section D produced a mean of 4.28, SD = 0.67. Both Q11 and Q12 scored higher than 4.20, which is a positive indicator for strategy use.

Table 2
Descriptive Statistics of Questionnaire Items

Item	Question Summary	Mean	SD
Q1	Made class more interesting	4.07	0.69
Q2	More engaged during activity	3.97	0.67
Q3	Encouraged class participation	3.90	0.66
Q4	Motivated to contribute ideas	3.60	0.72
Q5	Encouraged student interaction	4.33	0.61
Q6	Comfortable sharing ideas	3.90	0.66
Q7	Encouraged discussion among students	4.27	0.69
Q8	Helped understand lesson better	4.17	0.65
Q9	Helped apply lesson practically	4.43	0.57
Q10	Makes learning more effective	4.17	0.65
Q11	Want more SBL activities	4.33	0.66
Q12	More engaging than traditional lessons	4.23	0.68
Item	Question Summary	Mean	SD

Q9 scored the highest mean, highlighting the fact that students valued the practical application of knowledge through SBL.

4.2 Results of Classroom Observations

The classroom observations were collected during three sessions that were centred around SBL activities. The following table demonstrates the qualitative findings.

Table 3
Comparison of Student Interaction and Contribution between SBL and Traditional Lectures

Session	Phase	Activity Type	Student Interactions	Voluntary Contributions	Notes
1	Lecture	Explanation	2	3	Mostly passive listening
1	Lecture	Q&A	3	5	Few students dominated
1	SBL	Scenario Intro	6	7	Increased attention and curiosity
1	SBL	Group Discussion	15	10	Active peer exchange
1	SBL	Problem-Solving	18	12	High engagement, collaborative
2	Lecture	Explanation	1	2	Minimal engagement
2	Lecture	Q&A	2	4	Limited participation
2	SBL	Scenario Intro	5	6	Students attentive
2	SBL	Group Discussion	14	9	More students involved
2	SBL	Problem-Solving	17	11	Strong collaboration
3	Lecture	Explanation	2	3	Passive behaviour
3	Lecture	Q&A	3	4	Repeated responders
3	SBL	Scenario Intro	7	8	Interest increased
3	SBL	Group Discussion	16	11	Diverse participation
3	SBL	Problem-Solving	20	13	Highly interactive

Table 3 demonstrates SBL classroom observation as well as lecture-based. It compares average interactions between both session types.

Table 4

Averages between Student-to-Student Interactions and Voluntary Contributions

Phase	Avg. Student-to-Student Interactions	Avg. Voluntary Contributions
Lecture	2.2	3.5
SBL	14.8	10.2

The contrast between lecture-based and SBL sessions is shown in Table 4. Only 2.2 per activity were scored in student-to-student interaction regarding lecture sessions, with 3.5 average for voluntary contribution. Conversely, students' interactions scored an average of 14.8, and voluntary contributions averaged 10.2 in SBL sessions. The interaction counts were high, with 18,19 and 20, respectively, for problem-solving tasks. Similarly, the group discussion phases were highly active, reaching levels of 14 to 16. These results indicate that task-based and collaborative activities were a success at increasing student participation.

5. Discussion

The findings are discussed in this part in relation to the three research questions. It is directly informed by the quantitative and qualitative data and related to theoretical and empirical literature covered in Section 2. The first research question was about SBL increasing motivation and active contribution compared to lecture-based sessions. The results indicate a relatively positive acceptance of SBL across all twelve questionnaire items among respondents. The SBL acceptance by students indicates its superiority to the traditional teaching approach. This positive perception about SBL suggests that students appreciate opportunities to partake in active learning. One possible explanation was that students wanted to contribute to constructing knowledge to make the sessions more meaningful. From a constructivist perspective, the SBL sessions created environments that enhanced the cognitive engagement of students. Thus, they were encouraged to analyse situations and provide adequate justification for their decisions. Similarly, Stone (2012) reported that switching from a straight lecture to engaging, task-based instruction leads to increased student commitment and attendance in a higher-education course.

Regarding classroom responsiveness, an interesting pattern emerged: students were less confident about actively participating in discussions, even though they expressed interest in the SBL activities. This disparity is a strong indicator that interest itself need not be directly converted into active learner investment. It refers to an interest that is likely to develop at different rates with the involvement of SBL than with personal motivation to contribute, a gap in the study that suggests there may be greater variance in motivational stages. A student can be curious about an activity without feeling ready or confident enough to articulate their own thoughts. This interpretation is closely related to behavioural resistance cultures, as behavioural participation tends to develop more progressively than cognitive learner investment (Freeman et al., 2014). The lower score is not indicative of an SBL failure but rather evidence of behavioural confidence requiring longer periods of exposure to learner-centred environments.

Unlike questionnaire responses that reflect students' perception, observation data captured actual behaviours as convincing evidence of SBL effectiveness. The high involvement rating reveals how SBL changed students' feelings about these sessions. The small number of students who remained uncertain of SBL's benefits further supports this evidence. This particular contrast is crucial as an observational behaviour clue to collaborative rather than self-reported perception. One possible explanation is that students are gradually stimulated to join collaborative activities through communication and solution negotiation. Additionally, sharing

responsibility in problem-solving situations encourages peer interaction, especially for passive learners. This interpretation is consistent with Clark et al.'s (2020) argument. It suggests that passive student environments may initially push them to resist task-based activities. Nevertheless, task-based activities such as SBL can also counteract this resistance gradually and inspire participation over time.

Another important finding is the student-to-student interaction that demonstrated a sudden peak in numbers from lecture-based to SBL sessions. Taking into account that many students are strangers to each other, and the rise in voluntary contributions, is a clear sign that SBL sessions appeared to encourage development or at least change in student perception regarding their classroom learning. It closely corresponds to a behavioural economics concept that explains how learners can change behaviours during SBL activities more consistently than just relying on their own perception. Such a behavioural change is intertwined with SBL dynamics that promote social participation instead of depending on dyadic relationships.

Classroom observation unveiled another convincing piece of evidence of SBL effectiveness that answers the second research question. The field notes recorded instances such as little eye contact between students, passive listening, and only three students who volunteered to provide answers. This predominance in classroom culture is not surprising, as passivity is generally expected in higher education. However, the interaction counts during SBL demonstrated an increase, especially during problem-solving tasks, which was the most interactive activity. One explanation is that students became comfortable with the SBL format as sessions progressed. This behavioural change may be explained by the development of confidence and familiarity. This incremental improvement implies that learners need an adaptation period before becoming invested in active learning strategies.

Results also suggest that students shifted from peripheral to active participation. This progress reflects Lave and Wenger's (1991) principle of Legitimate Peripheral Participation. As a first step, students were enlisted in small groups tackling realistic situations. They were not just completing a specific task in class but rather were honing their membership within a professional community. Group discussion and problem-solving tasks contribute to what Lave and Wenger (1991) describe as spaces of situated practice. In such environments, students practiced professional role-plays, negotiate meaning amongst themselves, and advance through the process from the margins to full participation. The descriptions of the diverse participation that emerged in the observation field notes, and the highly interactive problem-solving phase, indicate that this process occurred even in the short three-week session. There was not much interaction during lecture times, and most interactions were only teacher-initiated, with a student responding to direct questions from the instructor. Throughout SBL phases, interactions were more likely to be student-initiated: a student raising a point, disagreeing with a peer, or pitching an alternative solution. This change from reactive to proactive participation matters because it does not simply illustrate active participation but reflects something deeper. Reactive participation requires only attention and recall, while proactive participation calls upon judgment, confidence, and intellectual risk-taking skills. Across the different phases of SBL, the interactions were mostly triggered by a student, by expressing disagreement, raising a point, or proposing an entirely new solution. The shift from a reactive to a proactive learner signals deeper outcomes than mere active participation. Proactivity requires judgement and intellectual risk-taking skills, while reactive learners need only attention and memorising.

Another finding disclosed that students recommended SBL use in subsequent sessions even though some participants reported not wishing to do it again. This willingness has implications

for instructional practice and teacher agency. Although it might be considered a contradiction, it could refer to an important pattern. It suggests that learners perceive SBL as a genuine learning strategy. It could also mean that SBL was accepted as a beneficial learning practice and not merely a change from lecture-based courses. For instructors, this is a positive element for the success of learning during classroom teaching as it increases chances of student integration in SBL practices. Previous studies stated that pedagogical innovation is most frequently prompted by instructors who can
respond to their students' needs rather than by top- down institutional requirements (Bascia et al., 2014). When students express a strong preference for a certain type of learning mode, instructors gain both motivation and a reason to sustain this innovation.

The interplay between student perception and self-efficacy is relevant as well. The findings suggest the importance of readiness to tackle challenging circumstances. It is closely related to repeated exposure to SBL environments to eventually strengthen students' learning skills. Bardach et al. (2021) concluded that SBL interventions improved self- efficacy and emotional classroom readiness due to exposure to a low-risk environment. In such environments, students had opportunities to take part in professional activities while receiving corresponding feedback. Learners' confidence was strengthened for future challenges because they believed in the support, they received in using their knowledge in practical contexts. It therefore reflects satisfaction with innovative sessions and the increasing sense of competence and readiness, which students associate with SBL.

A consistent pattern across the three research questions requires attention. Several students remained hesitant to partake in classroom discussions despite positive perceptions about SBL sessions. This disparity highlights the fact that creating opportunities for learners does not automatically eliminate personal barriers. Long-standing habits or unfamiliarity with collaborative practices may continue to inhibit classroom involvement, especially during early SBL stages of implementation. In this sense, SBL ought to be considered as a spark for participation and not as an immediate remedy for hesitation. SBL can create the conditions for active participation and a collaborative group, yet some students may face internal barriers to take advantage of its benefits. The findings, thus, imply that a sustained implementation might be necessary for SBL advantages to transform into tangible learning outcomes.

6. Conclusion

The present study inspected the SBL effectiveness in developing experiential learning in higher education classrooms. By combining quantitative and qualitative data, the mixed-method design uncovered patterns of behavioural change regarding participation, motivation, engagement, and perception of SBL as a newly introduced instructional strategy. The findings were consistent in matters of SBL benefits concerning an interactive learning environment through SBL implementation. Students reported a positive perception of taking part in SBL sessions as an engaging learning practice. It does not require a fundamental curriculum redesign or the use of new technology. It requires only a reconfiguration of classroom setup; from a space where the teacher delivers content to one where students use content.

6.1. Practical Implications

Several implications could be derived from the findings. In higher education, instructors can simply implement practices of SBL into their course curriculum without any major changes. Additionally, SBL provides actual opportunities for peer learning and increasing classroom

interaction, especially through collaborative problem-solving activities. Lastly, by creating environments where students are inspired to become collaborators instead of receivers of information, the SBL integration may noticeably decrease passive learning behaviours in higher education classrooms.

6.2. Recommendations

The findings propose various recommendations. The gradual integration of Scenario-Based Learning activities is encouraged together with traditional types of teaching to familiarize students with such a transition. Raising awareness among students for the importance of new skill acquisition may also be considered by institutions through practical strategies. Curriculum designers are also encouraged to implement collaborative problem-solving practices to enhance involvement of students in group work, while maintaining balance with learning outcomes.

7. Limitations

The current analysis is not without limitations. The sample is relatively small, comprising a single course from one institution, and the findings are not generalizable across contexts without caveats. The intervention lasted less than three weeks, which is a short period to capture changes in long-standing classroom habits. Self-report survey data and researcher observation were the main methods used to evaluate subjects, both of which carry subjectivity and social desirability bias. Longer intervention periods would enable researchers to assess whether the gap between environmental interaction and confidence in personal contribution erodes over time with prolonged exposure to SBL. Additionally, adding pre- and post-test measures of both engagement and academic performance would strengthen the capacity to make causal claims about the degree of SBL's effects. It could be important to conduct comparative studies in which SBL is compared to a control group receiving only traditional instruction. Finally, since various links were mentioned in the literature between SBL and low-risk activities, we might examine self-efficacy and potential implications for learning outcomes.

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