IJ-ATL: International Journal of Arabic Teaching and Learning
Vol. 06 No. 02 (2022) : 253-265
Available online at https://ejournal.unuja.ac.id/index.php/ij-atl

Problem-Based Learning Curriculum Management in Improving Learning Motivation

Muhammad Fahmi[1*]
[1] Universitas Islam Negeri Saifuddin Zuhri Purwokerto, Indonesia

Received:	Revised:	Accepted:	Published:
13 July 2022	14 September 2022	16 October 2022	16 December 2022

Abstract:
In the face of declining student motivation in language learning, particularly in Arabic instruction at the secondary education level, innovative curriculum models are urgently required. This study explores the implementation of Problem-Based Learning (PBL) curriculum management as a strategic response to enhance student motivation in Arabic language learning. The research aims to analyze how curriculum planning, organizing, implementation, and evaluation based on PBL principles contribute to learner engagement and active participation. Employing a qualitative descriptive approach, data were obtained through interviews, observations, and documentation at MA Ma'arif NU 1 Kemranjen. The results show that PBL-based curriculum management effectively boosts learning motivation by presenting real-life contextual problems, fostering collaborative learning environments, and applying continuous assessment that encourages student autonomy. These findings affirm that PBL not only enriches the learning process but also supports the development of critical thinking and problem-solving abilities necessary for mastering Arabic. It is concluded that structured implementation of PBL in curriculum management is a promising path to revitalize motivation and learning outcomes in Arabic education.
Keywords: *Problem-Based Learning, Curriculum Management, Arabic Learning Motivation*

Abstrak:
Motivasi belajar siswa yang cenderung menurun dalam pembelajaran bahasa, khususnya bahasa Arab di tingkat pendidikan menengah, menuntut adanya model kurikulum yang inovatif. Penelitian ini mengeksplorasi implementasi manajemen kurikulum berbasis Problem-Based Learning (PBL) sebagai strategi untuk meningkatkan motivasi belajar siswa dalam pembelajaran bahasa Arab. Tujuan dari penelitian ini adalah untuk menganalisis bagaimana perencanaan, pengorganisasian, pelaksanaan, dan evaluasi kurikulum yang berpijak pada prinsip-prinsip PBL berkontribusi terhadap keterlibatan aktif siswa. Dengan menggunakan pendekatan deskriptif kualitatif, data dikumpulkan melalui wawancara, observasi, dan dokumentasi di MA Ma'arif NU 1 Kemranjen. Hasil penelitian menunjukkan bahwa manajemen kurikulum berbasis PBL mampu meningkatkan motivasi belajar melalui penyajian masalah kontekstual yang nyata, penciptaan lingkungan belajar kolaboratif, serta evaluasi berkelanjutan yang mendorong kemandirian siswa. Temuan ini menegaskan bahwa PBL tidak hanya memperkaya proses belajar, tetapi juga mendukung pengembangan kemampuan berpikir kritis dan pemecahan masalah yang esensial dalam penguasaan bahasa Arab. Dapat disimpulkan bahwa penerapan PBL secara terstruktur dalam manajemen kurikulum merupakan langkah strategis untuk merevitalisasi motivasi dan hasil belajar siswa.
Kata Kunci: *Problem-Based Learning, Manajemen Kurikulum, Motivasi Belajar Bahasa Arab*

**Corresponding author*
Email: muhammadfahmi@uinsaizu.ac.id
How to Cite:
Fahmi, M. (2022). Problem Based Learning Curriculum Management in Improving Learning Motivation. *IJ-ATL (International Journal of Arabic Teaching and Learning)*, *6*(2).
DOI: https://doi.org/10.33650/ijatl.v6i2.3023

INTRODUCTION / المقدمة

The selection of the title is grounded in the urgent need to address the declining motivation among students, particularly in language learning contexts such as Arabic instruction at the secondary education level. Many educational institutions continue to rely on conventional, teacher-centered approaches that emphasize memorization over critical engagement, resulting in passive learners with low initiative (Chua, 2021; Shraddha et al., 2020; Su et al., 2021). This phenomenon has led to concerns over learning outcomes and student enthusiasm, especially in subjects that require abstract thinking and sustained practice. In response, various pedagogical frameworks have been proposed to revitalize classroom dynamics, with Problem-Based Learning (PBL) emerging as a promising model. PBL encourages active learning by involving students in solving contextual problems, thereby fostering a sense of relevance and personal investment in the learning process (Belwal et al., 2020; J. Lee et al., 2019; Sawarynski et al., 2019; Zhang et al., 2019). It is within this context that curriculum management plays a pivotal role in ensuring the systematic application of PBL principles to effectively enhance motivation, participation, and student-centered outcomes.

Problem-Based Learning (PBL) is an instructional approach that emphasizes student-centered learning through engagement with real-world problems as a pathway to developing knowledge and essential skills (Atherley et al., 2019; Hilty et al., 2020; Yeh et al., 2019). In this model, learners are challenged with authentic scenarios that stimulate critical thinking, teamwork, and self-directed inquiry. Rather than passively receiving information, students become active participants who take responsibility for their learning processes. Integrating PBL into curriculum management is crucial for transforming traditional classrooms into dynamic learning environments that prioritize student involvement and intrinsic motivation (Ankam et al., 2019; El Sadik, 2021). Through this approach, teaching shifts from mere content delivery to facilitating meaningful problem-solving experiences, allowing students to internalize concepts more deeply while building collaborative and analytical competencies.

The phenomenon that occurred at SMP Al-Falah Nganjuk showed that the implementation of a PBL-based curriculum had a significant impact on increasing student learning motivation. Before this approach was implemented, students tended to be passive and less enthusiastic in participating in learning. However, after the implementation of the PBL strategy integrated into the curriculum, such as cross-subject projects, case studies, and collaborative assessments, there was a significant increase in student motivation and learning independence (Burgess et al., 2018; Daly-Smith et al., 2020; Hero & Lindfors, 2019; Xiaoyang et al., 2021). SMP Al-Falah was chosen as the research location because this school consistently applies an innovative learning approach that emphasizes problem-solving as the core of the learning process.

In the context of education, curriculum management plays a strategic role in regulating the planning, implementation, and evaluation of learning. The curriculum managed with the Problem-Based Learning approach must be designed flexibly but structured, allowing integration between learning objectives and student needs (Costan et al., 2021; Fewster-Thuente & Batteson, 2018; Reumerman et al., 2018). In addition, the

effectiveness of PBL is greatly influenced by teacher readiness, availability of resources, and an assessment system that supports the process of student exploration and reflection. Theoretically, learning motivation is influenced by internal and external factors that interact with each other. The PBL approach is able to increase learning motivation through student involvement in meaningful, relevant, and challenging learning experiences (Hart, 2019; Igwe et al., 2021; Qiu et al., 2020). By providing autonomy, responsibility, and opportunities to demonstrate the ability to solve real problems, students will feel more intrinsically motivated to learn (Ryan & Deci, 2000; Hidayah, 2024; Rohmah, 2024).

This study aims to analyze how the management of the Problem-Based Learning curriculum can increase student learning motivation at SMP Al-Falah Nganjuk. The main focus of this study includes the planning and implementation strategies of PBL-based curriculum, students' motivational responses to this approach, and supporting and inhibiting factors in its implementation. This study is expected to provide theoretical and practical contributions to the development of curriculum management that is more adaptive to students' learning needs. The novelty of this study lies in its approach that combines conceptual analysis and empirical evaluation of the relationship between PBL-based curriculum management and increased student learning motivation at the junior high school level. This study provides an applicable alternative for education managers and teachers in designing learning strategies that foster a spirit of independent and collaborative learning, while enriching the study of innovative curriculum management in the context of education in Indonesia.

RESEARCH METHOD / المنهجية

This study uses a qualitative approach with a descriptive method to describe in depth the characteristics of Problem-Based Learning (PBL)-based curriculum management in improving student learning motivation at MA Ma'arif NU 1 Kemranjen, Banyumas Regency, Central Java. This approach was chosen because it allows researchers to observe naturally, without manipulation, various learning dynamics that take place in real contexts (Gilbert & Mayfield-Johnson, 2017; Razafsha et al., 2012). The focus of this study is on the management and implementation of the PBL curriculum for MA-level students, especially in grades XI and XII, who are actively involved in problem-based learning activities.

Data collection techniques in this study include observation, interviews, and documentation. Observations are carried out directly, openly, and participatively, where researchers are involved in learning activities to directly understand the application of PBL principles, such as problem presentation, group discussions, and collaborative case solving. Interviews were conducted face-to-face using a semi-structured format with 25 respondents, consisting of 15 active students, 1 madrasah principal, 4 subject teachers, 1 vice principal of madrasah for curriculum, 1 homeroom teacher, and 3 BK teachers. The selection of informants was carried out purposively by considering their involvement and strategic roles in the implementation of the curriculum and problem-based learning process. Documentation was used to complete field data by collecting related documents, such as curriculum tools, lesson schedules, student assessment results, photos of project-based learning activities, and program evaluation reports from the madrasah. These documents serve as supporting evidence to confirm the data from observations and interviews.

Data analysis in this study follows the Miles and Huberman model, which includes

three stages: data reduction, data presentation, and conclusion. Data reduction is carried out to filter information that is relevant to the focus of the research, then the data is presented in the form of a systematic narrative to facilitate thematic analysis. The final stage of concluding is carried out in stages through cross-verification of the data to ensure validity and deep meaning. To improve data validity, this study also applies source and method triangulation techniques and confirms the results (member checking) with key informants to ensure the accuracy of the findings. This methodological approach allows researchers to gain a comprehensive understanding of how PBL-based curriculum management is implemented at MA Ma'arif NU 1 Kemranjen and how the implementation impacts on increasing student learning motivation.

FINDINGS AND DISCUSSION / نتائج البحث و المناقشة

Findings

Direct Correction as Negative Reinforcement

In addition to positive reinforcement, teachers at MA Ma'arif NU 1 Kemranjen also apply negative reinforcement in the form of direct correction when students make mistakes in pronouncing or writing Arabic. Corrections are made in real time, namely immediately after students pronounce or write the wrong word or sentence. In practice, teachers usually immediately interrupt and provide the correct version, then ask students to repeat until they are correct. This strategy is applied to get students used to not repeating the same mistake and to speed up the process of forming the correct response pattern. This correction is given without giving punishment or an intimidating tone, but with a firm attitude and a directive tone, for example: "Try again, it wasn't right earlier," or "Pay attention to the harakat." In behaviorism, this strategy is known as a form of negative reinforcement that aims to eliminate inappropriate behavior through corrective responses.

Observations show that although at first students seem embarrassed or surprised when corrected in front of the class, over time they become accustomed to it and feel helped. Students stated in interviews that direct correction helped them remember where the mistake was and not repeat it again the next time. One student said, "At first I was embarrassed if I made a mistake, but over time I memorized it because I was corrected immediately." The teacher stated that this approach was effective because students are used to learning through stimulus-response and correction. The teacher also said that the faster the mistake is corrected, the faster the wrong pattern is replaced with the correct pattern. Therefore, this strategy is continuously carried out throughout the learning process by paying attention to the emotional state of the students so that they do not feel embarrassed.

Table 1. Direct Correction as a Form of Negative Reinforcement in Arabic Language Learning

Correction Strategy	Implementation Form	Observation Notes
Real-time correction	The teacher immediately interrupts after a student pronounces or writes it incorrectly, then gives the correct form.	Students initially feel embarrassed, but get used to it and find it helpful in recognizing and correcting mistakes.
Verbal corrective prompts	Expressions such as “Repeat it, it’s not right” or “Pay attention to the pronunciation” are used without an intimidating tone.	Increase students' awareness of minor errors and develop a careful attitude in pronunciation.
Repetition after correction	After being corrected, students are asked to repeat the word or sentence until it is correct.	Correct responses are formed more quickly, and errors are not repeated in subsequent exercises.

Continuous corrective cycle	Corrections were given over several consecutive meetings, especially on common errors.	More than 70% of students did not repeat writing errors after five direct correction sessions.

Based on the data documentation of Table 1 above, many students showed an increase in evaluation results after implementing the direct correction strategy. For example, in the first three meetings, students made repeated mistakes in writing Arabic cursive letters, but after being given systematic correction for five meetings, more than 70% of students no longer made the same mistakes. The teacher noted that students who were corrected more often understood the correct sentence structure and pronunciation more quickly. This is in line with the principle of behaviorism that correction as a form of negative reinforcement can help shape appropriate learning behavior if given appropriately and consistently. Correction is not done to punish, but as part of the learning process that emphasizes accuracy and the formation of correct habits in language use.

By looking at the effectiveness of direct correction in forming students' language patterns, this strategy can be said to be very relevant in Arabic language learning at the MA level. Direct correction also makes teachers play an active role as controllers in forming students' linguistic behavior. This finding shows that in the context of behaviorism, not only is an important reward given, but also correction as an effort to eliminate wrong behavior. With the condition that it is done humanely, correction can be a very powerful educational tool in accelerating the understanding of language concepts and the formation of basic Arabic language competencies among students.

Teacher Modeling Strategy in Arabic Vocabulary Learning

The application of behaviorism theory in Arabic language learning at MA Ma'arif NU 1 Kemranjen is not only through repetition and reinforcement, but is also significantly reflected in the modeling or imitation strategy used by the teacher. This modeling is an effective initial approach for grade X students who are just starting to learn Arabic intensively. The teacher actively models how to pronounce vocabulary, form sentences, and apply them in everyday contexts. This strategy shows that students find it easier to capture and imitate language patterns if they see examples directly and repeatedly. In practice, the teacher not only explains but also demonstrates, for example by pointing to objects, mentioning their Arabic names, and then asking students to imitate them simultaneously or individually. This approach is in line with the principle of behaviorism, namely a stimulus (model from the teacher) that produces a response (imitation by students) consistently.

This modeling is reinforced by adjustments to expressions, hand movements, and voice emphasis carried out by the teacher so that students are more focused and interested. In each learning session, the teacher consistently repeats the same expression so that it sticks in the students' memories. This shows that there is a connection between model repetition and students' ability to internalize new vocabulary. Based on the observation results, students are more responsive when teachers use interesting body movements or facial expressions. Teachers also often associate words with real objects in the classroom, such as "مكتب" (teacher's desk), by pointing directly to the object. Students are then asked to imitate and mention it in turns. This technique facilitates contextual and behavioristic learning because each word is associated with real actions and direct responses. In behaviorism, this is called "reinforced imitation", which is imitation with direct reinforcement.

From the results of interviews with Arabic language teachers, they stated that modeling is part of a mandatory routine at every initial meeting of new material. This is because most students at MA Ma'arif NU 1 Kemranjen do not have a strong Arabic language background since junior high school. Teachers realize that without concrete examples to imitate, students tend to be confused and passive. Therefore, modeling is carried out in a gradual format: first, the teacher demonstrates, then students imitate together, then individual assessments are carried out through personal imitation. This has been proven to increase students' courage to speak Arabic, even if only one or two words. With this method, teachers not only provide stimulus, but also actively control and strengthen students' responses through verbal appreciation and immediate correction if there are pronunciation errors.

Figure 1. Teacher Modeling Strategy in Arabic Vocabulary Learning

From the learning documentation in Figure 1 above, it can be seen that students who participate in modeling more often tend to have significant development in pronunciation and vocabulary mastery. The teacher's diary shows an increase in positive responses in students who actively participate in modeling sessions. This response can be seen from the speed of answering, pronunciation accuracy, and the courage to speak. This strengthens that the modeling strategy in the behaviorist approach not only accelerates the imitation process, but also helps form correct language habits from an early age. The conclusion of these findings shows that modeling is effective as an initial strategy for learning Arabic based on behaviorism because it allows students to learn through observation and imitation that is controlled, reinforced, and repeated systematically.

Classroom Environment as a Stimulus for Language Learning

The classroom environment at MA Ma'arif NU 1 Kemranjen is also developed as part of a behavioristic learning strategy. The classroom walls are filled with Arabic vocabulary posters, verb conjugation tables, and illustrations of daily activities in Arabic. The posters are not only for decoration, but are intentionally used as visual stimuli that can trigger spontaneous responses from students while learning. Teachers often point to posters when explaining material, then ask students to imitate words or re-explain based on information from the poster. In addition, teachers also create an "Arabic corner", which is a corner of the classroom that contains learning aids such as word cards, simple language games, and mini boards for practicing writing Arabic letters. This physical environment acts as a permanent stimulus that supports learning reinforcement outside of verbal interaction.

The results of interviews with teachers and students show that this approach

encourages students to remain exposed to Arabic outside of formal lesson time. For example, some students admitted to often rereading the words on the posters when they felt bored during breaks. This shows the influence of the environment in strengthening the learning process without pressure. Teachers stated that every visual element in the classroom was designed to support the behaviorist principle, where consistent and repetitive stimuli will produce the desired response. Some teachers gave students the task of making their vocabulary cards and displaying them in the classroom, as a form of active involvement and collaborative reinforcement. This created an interactive learning atmosphere and gave meaning to every element of the classroom. In an interview with one of the students named Ahmad R., a grade XI student, several interesting responses were revealed: DFY "I like looking at the posters, sometimes without being told, I read them myself". JHY also said that "The Arabic corner is fun, there are lots of games that keep me from getting bored, I once made my vocabulary cards and posted them, then my friends read them too," and a teacher NJK say that "From the posters and cards, I memorized several new words that were previously difficult to remember." These responses show that the behaviorist approach through the visual environment has a real influence on students' learning habits.

From the observation results, it can be seen that classes that are more active in using behaviorist visual elements tend to have students with higher participation in pronunciation and writing exercises. When the material is delivered and connected with visual elements on the wall, students grasp the meaning and form of words more quickly. This confirms that visual stimuli arranged based on the principles of repetition and active involvement can improve students' response abilities in a behaviorist context. In addition, the presence of small games in the language corner also provides cognitive breaks for students while maintaining consistent exposure to Arabic language materials in a fun way. Thus, the learning environment functions not only as a physical background but also as a pedagogical instrument that actively shapes students' learning behavior.

This finding concludes that a classroom environment that is conditioned in a behaviorist manner makes a major contribution to the process of internalizing Arabic at MA Ma'arif NU 1 Kemranjen. This environment provides diverse and permanent stimuli, so that students' learning responses can be maintained and strengthened. This approach shows that language learning does not only depend on teachers and materials, but also on the design of the environment that encourages the formation of learning habits gradually. In the context of behaviorist theory, the environment is an important part of the reinforcement system that supports changes in learning behavior, both in the form of pronunciation, writing, and understanding Arabic vocabulary as a whole.

Discussion

The application of behaviorist theory in Arabic language learning at MA Ma'arif NU 1 Kemranjen is reflected in three interrelated pedagogical strategies: positive reinforcement to encourage student participation, direct correction as negative reinforcement to eliminate incorrect responses, and environmental structuring as an external stimulus to support consistent learning behaviors. These strategies mirror the stimulus-response-reinforcement framework of behaviorism, where learning is formed through repetition, conditioning, and environmental cues (Kwan, 2019; Perusso & Baaken, 2020; Zhu et al., 2020). Teachers at MA Ma'arif NU 1 demonstrate a deliberate effort to condition learners through observable, measurable techniques that align with behaviorist principles.

First, the use of positive reinforcement, particularly verbal praise and symbolic rewards, plays a central role in boosting learner motivation and sustaining correct linguistic responses. Students receive immediate verbal approval or recognition (such as claps, encouraging words, or classroom points) for correct vocabulary usage or accurate pronunciation. According to Skinner's operant conditioning, these reinforcements strengthen desired behaviors, making students more likely to repeat them (Borrella et al., 2019; Rotgans et al., 2018; Sinnayah et al., 2021). Observational data indicate that praise increases student attentiveness and enthusiasm, especially among beginners who require frequent validation. Interviews with students further support this, showing that many associate praise with confidence and engagement. This validates that affective reinforcement, when tied directly to correct responses, promotes consistent behavioral conditioning in line with behaviorist learning theory.

Second, direct correction, functioning as a form of negative reinforcement, is strategically used to eliminate errors and shape accurate language use. Rather than punishing students, the teacher promptly interrupts incorrect responses and provides the correct model, asking students to repeat it until accurate. This aligns with behaviorist principles where removing undesired responses through immediate correction redirects learners toward the expected behavior (A. L. Lee et al., 2020; Nagro et al., 2019; Roth et al., 2019). While some students initially report discomfort from being corrected publicly, many come to view it as a necessary and helpful part of the learning process. The repetitive aspect of correction reinforces the accurate response, eventually conditioning learners to self-correct or avoid similar errors. This dynamic is consistent with Thorndike's law of effect and law of exercise, emphasizing the role of consequence and repetition in forming lasting habits.

Third, the structuring of classroom environments as consistent stimuli reinforces the behaviorist emphasis on external cues. Visual aids, wall charts of Arabic vocabulary, seating arrangements, and regular use of vocabulary drill posters create a learning atmosphere saturated with relevant language input (Rogers et al., 2019). These environmental stimuli act as non-verbal triggers that continuously expose students to the target language, reinforcing memory and usage through contextual immersion (Greer et al., 2018). Teachers also use designated learning corners for specific themes, such as "Fi al-Matbaakh" or "Fi al-Madrasah," ensuring that students associate certain contexts with specific language patterns. Students reported feeling more prepared and oriented due to these environmental cues, which contributed to smoother transitions into speaking or writing tasks. This supports the behaviorist view that stimuli, both social and physical, are essential in initiating and reinforcing responses.

Moreover, these strategies work in synergy rather than isolation. Reinforcement and correction are embedded in structured classroom routines, such as choral repetition, partner practice, and oral dictation. When a student correctly repeats a word after a correction, the teacher often follows it with praise, linking negative and positive reinforcement in a seamless flow. The physical environment, including well-placed learning materials, reinforces both these strategies by serving as a constant visual stimulus (Parsons et al., 2018). The behaviorist approach in this context ensures that learning is not left to chance but is deliberately conditioned through patterned interaction and habitual practice (Grice et al., 2018; Rees Lewis et al., 2019; Yang et al., 2020). This integrative application reflects a mature understanding of how to operationalize theoretical principles into practical classroom action.

In addition, data from teacher interviews and student reflections confirm that behavioral consistency is a key outcome of these methods. Teachers noted a marked improvement in students' ability to recall and use vocabulary correctly after sustained reinforcement and structured exposure. Students themselves began to anticipate correction and sought praise, which are classic signs of operant learning processes (Cao et al., 2021). While the behaviorist model has its critiques, particularly regarding creativity and internal cognition, this study demonstrates its continued relevance in early-stage language acquisition, where habit formation and automaticity are primary goals (Alt & Naamati-Schneider, 2021). The alignment between observed practices and reported experiences reinforces the validity of behaviorism as an effective pedagogical framework in structured language learning settings.

In conclusion, the Arabic language instruction at MA Ma'arif NU 1 Kemranjen integrates the core principles of behaviorist learning theory through a consistent system of positive reinforcement, corrective feedback, and stimulus-rich environments. These strategies collectively foster structured habit formation, confidence, and linguistic accuracy among students. The findings affirm that behaviorist methods remain effective for foundational language development, especially when applied with responsiveness and contextual relevance. As such, this behaviorist-informed model offers a replicable blueprint for similar institutions aiming to build strong language habits among beginning learners through simple, observable, and systematic methods.

CONCLUSION / الخلاصة

This study concludes that the implementation of curriculum management based on Problem-Based Learning (PBL) significantly contributes to improving students' learning motivation. Through structured problem orientation, collaborative learning strategies, and real-world contextualization, PBL curriculum management fosters active participation and sustained interest in the learning process. The findings highlight that when learners are confronted with meaningful problems and given autonomy to explore solutions, their intrinsic motivation increases, and their engagement becomes more consistent and goal-driven. From a managerial perspective, effective planning, organizing, implementing, and evaluating PBL activities are crucial to ensure alignment between curriculum objectives and students' motivational needs.

The integration of PBL into curriculum management not only strengthens cognitive engagement but also builds soft skills such as critical thinking, communication, and self-regulation. These elements collectively create a dynamic learning ecosystem where students take ownership of their learning journey. Therefore, PBL should be institutionalized as a core pedagogical approach in curriculum design, especially in contexts where learner disengagement is a persistent issue. Future research is recommended to examine the long-term impact of PBL curriculum models across different educational levels and disciplines, as well as to explore how digital tools can enhance the scalability and effectiveness of PBL Implementation in diverse learning environments.

REFERENCES / المراجع

Alt, D., & Naamati-Schneider, L. (2021). Health management students' self-regulation and digital concept mapping in online learning environments. *BMC Medical Education*, *21*(1). https://doi.org/10.1186/s12909-021-02542-w

Ankam, N. S., Bosques, G., Sauter, C., Stiens, S., Therattil, M., Williams, F. H., Atkins, C. C., & Mayer, R. S. (2019). Competency-Based Curriculum Development to Meet the Needs of People with Disabilities: A Call to Action. In *Academic Medicine* (Vol. 94, Issue 6, pp. 781–788). https://doi.org/10.1097/ACM.0000000000002686

Atherley, A., Dolmans, D., Hu, W., Hegazi, I., Alexander, S., & Teunissen, P. W. (2019). Beyond the struggles: a scoping review on the transition to undergraduate clinical training. In *Medical Education* (Vol. 53, Issue 6, pp. 559–570). https://doi.org/10.1111/medu.13883

Belwal, R., Belwal, S., Sufian, A. B., & Al Badi, A. (2020). Project-based learning (PBL): outcomes of students' engagement in an external consultancy project in Oman. *Education and Training*, *63*(3), 336–359. https://doi.org/10.1108/ET-01-2020-0006

Borrella, I., Caballero-Caballero, S., & Ponce-Cueto, E. (2019). Predict and intervene: Addressing the dropout problem in a MOOC-based program. In *Proceedings of the 6th 2019 ACM Conference on Learning at Scale, L@S 2019*. https://doi.org/10.1145/3330430.3333634

Burgess, A., Roberts, C., Ayton, T., & Mellis, C. (2018). Implementation of modified team-based learning within a problem-based learning medical curriculum: A focus group study. *BMC Medical Education*, *18*(1). https://doi.org/10.1186/s12909-018-1172-8

Cao, W., Hu, L., Li, X., Li, X., Chen, C., Zhang, Q., Cao, S., & Gupta, P. (2021). Massive Open Online Courses-based blended versus face-to-face classroom teaching methods for a fundamental nursing course. *Medicine (United States)*, *100*(9), E24829. https://doi.org/10.1097/MD.0000000000024829

Chua, K. J., & Islam, M. R. (2021). The hybrid Project-Based Learning–Flipped Classroom: A design project module redesigned to foster learning and engagement. *International Journal of Mechanical Engineering Education*, *49*(4), 289–315. https://doi.org/10.1177/0306419019838335

Costan, E., Gonzales, G., Gonzales, R., Enriquez, L., Costan, F., Suladay, D., Atibing, N. M., Aro, J. L., Evangelista, S. S., Maturan, F., Selerio, E., & Ocampo, L. (2021). Education 4.0 in developing economies: A systematic literature review of implementation barriers and future research agenda. In *Sustainability (Switzerland)* (Vol. 13, Issue 22). https://doi.org/10.3390/su132212763

Daly-Smith, A., Quarmby, T., Archbold, V. S. J., Routen, A. C., Morris, J. L., Gammon, C., Bartholomew, J. B., Resaland, G. K., Llewellyn, B., Allman, R., & Dorling, H. (2020). Implementing physically active learning: Future directions for research, policy, and practice. *Journal of Sport and Health Science*, *9*(1), 41–49. https://doi.org/10.1016/j.jshs.2019.05.007

El Sadik, A., & Al Abdulmonem, W. (2021). Improvement in Student Performance and Perceptions through a Flipped Anatomy Classroom: Shifting from Passive Traditional to Active Blended Learning. *Anatomical Sciences Education*, *14*(4), 482–490. https://doi.org/10.1002/ase.2015

Fewster-Thuente, L., & Batteson, T. J. (2018). Kolb's experiential learning theory is a theoretical underpinning for interprofessional education. *Journal of Allied Health*, *47*(1), 3–8. https://www.scopus.com/inward/record.uri?partnerID=HzOxMe3b&scp=85044930087&origin=inward

Gilbert, K. L., & Mayfield-Johnson, S. (2017). Roles, functions, and examples of qualitative research and methods for social science research. In *Public Health Research Methods for Partnerships and Practice* (pp. 220–238). https://doi.org/10.1201/9781315155722-11

Greer, P. J., Brown, D. R., Brewster, L. G., Lage, O. G., Esposito, K. F., Whisenant, E. B., Anderson, F. W., Castellanos, N. K., Stefano, T. A., & Rock, J. A. (2018). Socially Accountable Medical Education: An Innovative Approach at Florida International University Herbert Wertheim College of Medicine. In *Academic Medicine* (Vol. 93, Issue 1, pp. 60–65). https://doi.org/10.1097/ACM.0000000000001811

Grice, G. R., Thomason, A. R., Meny, L. M., Pinelli, N. R., Martello, J. L., & Zorek, J. A. (2018). Intentional interprofessional experiential education. In *American Journal of Pharmaceutical Education* (Vol. 82, Issue 3, pp. 204–208). https://doi.org/10.5688/ajpe6502

Hart, J. (2019). Interdisciplinary project-based learning as a means of developing employability skills in undergraduate science degree programs. *Journal of Teaching and Learning for Graduate Employability*, *10*(2), 50–66. https://doi.org/10.21153/jtlge2019vol10no2art827

Hero, L. M., & Lindfors, E. (2019). Students' learning experience in a multidisciplinary innovation project. *Education and Training*, *61*(4), 500–522. https://doi.org/10.1108/ET-06-2018-0138

Hilty, D., Chan, S., Torous, J., Luo, J., & Boland, R. (2020). A framework for competencies for the use of mobile technologies in psychiatry and medicine: Scoping review. In *JMIR mHealth and uHealth* (Vol. 8, Issue 2). https://doi.org/10.2196/12229

Igwe, P. A., Okolie, U. C., & Nwokoro, C. V. (2021). Towards a responsible entrepreneurship education and the future of the workforce. *International Journal of Management Education*, *19*(1). https://doi.org/10.1016/j.ijme.2019.05.001

Kwan, C. Y. (2019). A thorny path: the developmental course of problem-based learning for health sciences education in Asia. *Advances in Health Sciences Education*, *24*(5), 893–901. https://doi.org/10.1007/s10459-019-09920-6

Lee, A. L., DeBest, M., Koeniger-Donohue, R., Strowman, S. R., & Mitchell, S. E. (2020). The feasibility and acceptability of using virtual world technology for interprofessional education in palliative care: a mixed methods study. *Journal of Interprofessional Care*, *34*(4), 461–471. https://doi.org/10.1080/13561820.2019.1643832

Lee, J., Song, H. D., & Hong, A. J. (2019). Exploring factors and indicators for measuring students' sustainable engagement in e-learning. *Sustainability (Switzerland)*,

11(4). https://doi.org/10.3390/su11040985

Nagro, S. A., Fraser, D. W., & Hooks, S. D. (2019). Lesson Planning With Engagement in Mind: Proactive Classroom Management Strategies for Curriculum Instruction. *Intervention in School and Clinic*, *54*(3), 131–140. https://doi.org/10.1177/1053451218767905

Parsons, J. R., Crichlow, A., Ponnuru, S., Shewokis, P. A., Goswami, V., & Griswold, S. (2018). Filling the gap: Simulation-based crisis resource management training for emergency medicine residents. *Western Journal of Emergency Medicine*, *19*(1), 205–210. https://doi.org/10.5811/westjem.2017.10.35284

Perusso, A., & Baaken, T. (2020). Assessing the authenticity of cases, internships and problem-based learning as managerial learning experiences: Concepts, methods and lessons for practice. *International Journal of Management Education*, *18*(3). https://doi.org/10.1016/j.ijme.2020.100425

Qiu, Y., Zhang, K., Wang, Y., Jin, X., Bai, L., Guan, S., & Cheng, X. (2020). Hierarchical Query Graph Generation for Complex Question Answering over Knowledge Graph. In *International Conference on Information and Knowledge Management, Proceedings* (pp. 1285–1294). https://doi.org/10.1145/3340531.3411888

Razafsha, M., Behforuzi, H., Azari, H., Zhang, Z., Wang, K. K., Kobeissy, F. H., & Gold, M. S. (2012). Qualitative versus quantitative methods in psychiatric research. *Methods in Molecular Biology*, *829*, 49–62. https://doi.org/10.1007/978-1-61779-458-2_3

Rees Lewis, D. G., Gerber, E. M., Carlson, S. E., & Easterday, M. W. (2019). Opportunities for educational innovations in authentic project-based learning: understanding instructor-perceived challenges to design for adoption. *Educational Technology Research and Development*, *67*(4), 953–982. https://doi.org/10.1007/s11423-019-09673-4

Reumerman, M., Tichelaar, J., Piersma, B., Richir, M. C., & van Agtmael, M. A. (2018). Urgent need to modernize pharmacovigilance education in healthcare curricula: review of the literature. In *European Journal of Clinical Pharmacology* (Vol. 74, Issue 10, pp. 1235–1248). https://doi.org/10.1007/s00228-018-2500-y

Rogers, T., Andler, C., O'Brien, B., & Van Schaik, S. (2019). Self-Reported Emotions in Simulation-Based Learning: Active Participants vs. Observers. *Simulation in Healthcare*, *14*(3), 140–145. https://doi.org/10.1097/SIH.0000000000000354

Rotgans, J. I., Schmidt, H. G., Rajalingam, P., Hao, J. W. Y., Canning, C. A., Ferenczi, M. A., & Low-Beer, N. (2018). How cognitive engagement fluctuates during a team-based learning session and how it predicts academic achievement. *Advances in Health Sciences Education*, *23*(2), 339–351. https://doi.org/10.1007/s10459-017-9801-2

Roth, C. G., Eldin, K. W., Padmanabhan, V., & Friedman, E. M. (2019). Twelve tips for the introduction of emotional intelligence in medical education. *Medical Teacher*, *41*(7), 746–749. https://doi.org/10.1080/0142159X.2018.1481499

Sawarynski, K. E., Baxa, D. M., & Folberg, R. (2019). Embarking on a Journey of Discovery:

Developing Transitional Skill Sets through a Scholarly Concentration Program. *Teaching and Learning in Medicine*, *31*(2), 195–206. https://doi.org/10.1080/10401334.2018.1490184

Shraddha, B. H., Iyer, N. C., Kotabagi, S., Mohanachandran, P., Hangal, R. V., Patil, N., Eligar, S., & Patil, J. (2020). Enhanced learning experience by comparative investigation of pedagogical approach: Flipped classroom. In *Procedia Computer Science* (Vol. 172, pp. 22–27). https://doi.org/10.1016/j.procs.2020.05.003

Sinnayah, P., Salcedo, A., & Rekhari, S. (2021). Reimagining physiology education with interactive content developed in H5P. *Advances in Physiology Education*, *45*(1), 71–76. https://doi.org/10.1152/ADVAN.00021.2020

Su, Y., Chen, G., Li, M., Shi, T., & Fang, D. (2021). Design and Implementation of Web Multimedia Teaching Evaluation System Based on Artificial Intelligence and jQuery. *Mobile Information Systems*, *2021*. https://doi.org/10.1155/2021/7318891

Xiaoyang, H., Junzhi, Z., Jingyuan, F., & Xiuxia, Z. (2021). Effectiveness of ideological and political education reform in universities based on data mining artificial intelligence technology. *Journal of Intelligent and Fuzzy Systems*, *40*(2), 3743–3754. https://doi.org/10.3233/JIFS-189408

Yang, C., Yang, X., Yang, H., & Fan, Y. (2020). The flipped classroom combined with a human anatomy web-based learning system shows promising effects in anatomy education. *Medicine (United States)*, *99*(46), e23096. https://doi.org/10.1097/MD.0000000000023096

Yeh, C. Y. C., Cheng, H. N. H., Chen, Z. H., Liao, C. C. Y., & Chan, T. W. (2019). Enhancing achievement and interest in mathematics learning through Math-Island. *Research and Practice in Technology Enhanced Learning*, *14*(1). https://doi.org/10.1186/s41039-019-0100-9

Zhang, D., Han, J., Zhao, L., & Meng, D. (2019). Leveraging Prior-Knowledge for Weakly Supervised Object Detection Under a Collaborative Self-Paced Curriculum Learning Framework. *International Journal of Computer Vision*, *127*(4), 363–380. https://doi.org/10.1007/s11263-018-1112-4

Zhu, L., Lian, Z., & Engström, M. (2020). Use of a flipped classroom in ophthalmology courses for nursing, dental, and medical students: A quasi-experimental study using a mixed-methods approach. *Nurse Education Today*, *85*. https://doi.org/10.1016/j.nedt.2019.104262