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BULETIN APB

EDUCATION FOR BETTER FUTURE



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Bahasa Malaysia

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Memperkasakan Pelajar Malaysia Melalui Bahasa Ketiga

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Dalam era dunia yang semakin terhubung dan dinamik, wacana "Pendidikan untuk Masa Hadapan yang Lebih Baik" (*Education for a Better Future*) menuntut perubahan besar terhadap cara kita mendidik generasi muda. Pendidikan masa hadapan tidak lagi cukup sekadar mempelajari mata pelajaran asas. Sebaliknya, kita perlu membekalkan pelajar dengan kemahiran kalis masa hadapan (*future-proof skills*) yang mampu membina daya tahan dan ketersediaan global.

Adaptasi persekitaran budaya di Malaysia yang mempunyai pelbagai kaum, penguasaan bahasa ketiga bukan lagi sekadar kemahiran tambahan. Sebaliknya, ia bertindak sebagai pelaburan penting yang mengukuhkan perkembangan minda, akademik, kerjaya serta sosial pelajar. Oleh itu, pendedahan kepada bahasa ketiga sewajarnya dijadikan teras utama bagi melahirkan generasi yang berdaya saing, berfikiran terbuka serta mampu menyesuaikan diri dalam abad ke-21 ini.

Daripada sudut akademik dan kognitif, penguasaan bahasa ketiga memberi nilai tambah yang besar kepada perkembangan minda pelajar. Kebolehan bertutur pelbagai bahasa membuka akses yang lebih luas kepada sumber maklumat, khazanah ilmu dan bahan akademik daripada pelbagai komuniti antarabangsa. Sejajar dengan pandangan Bhatti et al. (2020), penguasaan pelbagai bahasa mempunyai kaitan rapat dengan peningkatan prestasi akademik dan fungsi kognitif, khususnya dari segi keupayaan menyelesaikan masalah serta fleksibiliti mental. Selain itu, proses mempelajari tatabahasa, kosa kata dan sistem komunikasi yang baharu menuntut pelajar menyesuaikan strategi pembelajaran secara berkesan. Proses ini secara tidak langsung membina pemikiran kritis dan adaptif.



Di samping faedah akademik, penguasaan bahasa ketiga turut membuka peluang yang lebih luas dalam realiti kehidupan dan kerjaya. Ini kerana, kebolehan berkomunikasi dalam pelbagai bahasa membolehkan individu berinteraksi secara berkesan dengan organisasi atau komuniti antarabangsa. Asensio Ferreiro (2025) ada menegaskan bahawa kemahiran pelbagai bahasa berupaya meluaskan peluang kerjaya serta meningkatkan penglibatan individu di peringkat antarabangsa. Bagi pelajar di Malaysia, nilai tambah ini amat berguna sama ada untuk tujuan mobiliti akademik, melanjutkan pengajian ke luar negara mahupun menceburi sektor pekerjaan global. Penguasaan bahasa tambahan ini juga membolehkan mereka membina jaringan profesional merentasi sempadan budaya.

Seterusnya, pembelajaran bahasa ketiga membantu membina kemahiran memahami budaya baharu (*intercultural competence*). Apabila mempelajari bahasa lain, pelajar berpotensi untuk mengenal dan membandingkan budaya yang berbeza. Proses tersebut membuatkan pelajar lebih peka serta mudah menyesuaikan diri dalam persekitaran yang didiami oleh pelbagai kaum dan budaya. Pembelajaran bahasa berteraskan budaya ini juga mengeratkan hubungan sosial serta memberi pengalaman sebenar, sekali gus meningkatkan motivasi dan keyakinan pelajar untuk berkomunikasi dengan lebih yakin (Lenkaitis et al., 2020).

Adapun daripada sudut pembangunan diri pula, pembelajaran bahasa ketiga wajar dijadikan pemangkin kepada budaya pembelajaran sepanjang hayat. Kajian oleh Kacetl dan Klímová (2021) membuktikan bahawa pembelajaran bahasa pada peringkat dewasa atau usia tua mampu memberi rangsangan fikiran, motivasi diri serta kepuasan peribadi. Hal ini jelas menunjukkan bahawa faedah bahasa ketiga tidak terhad kepada fasa persekolahan atau pengajian tinggi semata-mata. Sebaliknya, ia kekal berguna dan boleh terus ditingkatkan mengikut keperluan hidup serta kerjaya individu.

Secara keseluruhannya, penguasaan bahasa ketiga adalah kemahiran yang sangat penting terutama untuk perkembangan minda, peluang kerjaya yang lebih luas, kesedaran budaya luar serta pembentukan sikap pembelajaran sepanjang hayat. Justeru, pendidikan bahasa ketiga tidak harus dilihat sebagai subjek sampingan semata-mata, sebaliknya sebagai langkah utama bagi menyiapkan generasi muda Malaysia menjadi generasi yang ampuh, unggul serta bersedia melangkah seiring dengan perkembangan dunia semasa

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Literasi Digital: Kemahiran Asas Generasi Masa Hadapan

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Perkembangan teknologi digital telah mengubah cara manusia belajar, bekerja, berkomunikasi, dan memperoleh maklumat. Jika suatu ketika dahulu pelajar bergantung kepada buku teks, perpustakaan, dan penerangan guru untuk memperoleh pengetahuan, hari ini maklumat boleh diakses hanya dengan beberapa sentuhan pada skrin. Enjin carian, media sosial, platform pembelajaran dalam talian, dan kecerdasan buatan *(AI)* menyediakan akses kepada pelbagai sumber yang boleh diperoleh dalam tempoh yang sangat singkat.

Namun, kemampuan menggunakan teknologi tidak menjadikan seseorang itu celik digital. Literasi digital bukan sekadar kebolehan menggunakan teknologi, tetapi merangkumi kemahiran mencari dan menilai maklumat, komunikasi, penciptaan kandungan, etika dan penyelesaian masalah (Sánchez-Caballé et al., 2020). Seiring dengan perkembangan digital dalam kehidupan, literasi digital telah menjadi kemahiran asas yang perlu dikuasai oleh generasi masa hadapan

Penerapan Literasi Digital dan Cabaran Ketepatan Maklumat

Kemunculan teknologi *AI* generatif membawa perubahan besar dalam bidang pendidikan. Pelajar kini memanfaatkan *AI* untuk memahami konsep, menjana idea, menterjemahkan teks, serta menyusun maklumat. Dalam konteks pendidikan di Malaysia, penerapan literasi digital merangkumi pelbagai aspek kompetensi digital seperti literasi maklumat dan data, penciptaan kandungan, keselamatan digital, penyelesaian masalah, serta kewarganegaraan digital (Abd Ghafar et al., 2025).

Literasi digital kini melangkaui sempadan asas dan beralih kepada literasi *AI,* yang merangkumi pengetahuan teknikal, pemikiran kritis, dan pertimbangan etika yang khususnya berkaitan dengan penggunaan *AI* (Chiu et al., 2024; Tzirides et al., 2024). Walau bagaimanapun, kemajuan teknologi tanpa nilai kemanusiaan hanya melahirkan masyarakat yang pantas memperoleh maklumat, tetapi kurang bijak dalam memanfaatkannya. Oleh itu, fokus literasi *AI* bukan hanya untuk mendapatkan jawapan dengan pantas, sebaliknya untuk mendidik pelajar agar memahami, menilai, dan mengesahkan maklumat secara bijak (Tzirides et al., 2024; Zhong & Liu, 2024).

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Maklumat yang dijana oleh *AI* tidak semestinya tepat. Walaupun kelihatan tersusun dan meyakinkan, output tersebut tetap perlu dinilai secara kritis. Sehubungan dengan itu, institusi pendidikan dan para pendidik memainkan peranan penting dalam membangunkan kompetensi digital pelajar. Penerapan literasi digital perlu merentasi pelbagai subjek, bukan hanya terhad kepada bidang teknologi maklumat sahaja. Pengintegrasian literasi digital dan *AI* yang beretika berupaya menyokong pembelajaran kendiri, kreativiti, serta kolaborasi pelajar, menjadikan *AI* sebagai alat yang membantu manusia berfikir, bukannya menggantikan proses pemikiran (Socradji, 2025).



Etika dan Tanggungjawab dalam Ruang Digital

Kemudahan yang ditawarkan oleh teknologi tidak seharusnya dijadikan alasan untuk mengabaikan integriti akademik. Penggunaan *AI* dalam pendidikan turut menimbulkan persoalan etika, khususnya yang berkaitan dengan plagiarisme, kebergantungan terhadap teknologi dan kemungkinan kemerosotan kemahiran berfikir secara kritis (Mohd Salleh et al., 2025).

Literasi digital dan etika merupakan dua elemen penting yang saling melengkapi bagi memastikan internet digunakan secara bijaksana dan berintegriti. Dunia digital kadangkala menimbulkan tanggapan bahawa perkara yang berlaku di sebalik skrin tidak memberikan kesan terhadap kehidupan sebenar. Sebelum berkongsi sebarang kandungan, pengguna perlu juga menilai kesahihan serta kesannya terhadap orang lain. Menurut Ashaari et al. (2022), penggunaan teknologi secara berhemah memerlukan kesedaran tentang hak, tanggungjawab, etika dan keselamatan digital.

Selain itu, generasi masa kini juga perlu memahami konsep jejak digital (*digital footprint*). Kandungan yang dimuat naik pada hari ini mungkin kekal dalam ruang digital untuk tempoh yang panjang, walaupun telah dipadamkan daripada akaun asal. Kesedaran ini penting agar mereka lebih berhati-hati ketika berkongsi maklumat peribadi, gambar, lokasi atau pandangan yang berpotensi menjejaskan diri mereka pada masa hadapan.

Literasi digital bukan lagi sekadar kelebihan, tetapi merupakan satu keperluan dalam dunia masa kini. Generasi masa hadapan bukan sahaja perlu mengetahui cara menggunakan teknologi, malah perlu bijak menilai maklumat, menjaga privasi dan keselamatan, menghormati orang lain serta menggunakan teknologi secara beretika dan bertanggungjawab. Kesimpulannya, teknologi akan terus berkembang dari semasa ke semasa, namun keupayaan manusia untuk berfikir, menilai dan membuat keputusan tetap menjadi asas yang tidak boleh digantikan.



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Pendidikan Membentuk Masa Depan: Pembelajaran Melangkaui Sempadan melalui BioGlobal 2026

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Pendidikan sering dikaitkan dengan bilik kuliah, buku teks, peperiksaan dan pencapaian akademik. Namun, dunia yang menanti mahasiswa selepas tamat pengajian jauh lebih kompleks daripada apa yang dapat digambarkan melalui silibus semata-mata. Perubahan teknologi, cabaran alam sekitar dan hubungan masyarakat yang semakin merentas sempadan menuntut graduan yang bukan sahaja berpengetahuan, tetapi juga mampu menggunakan ilmu dalam situasi sebenar. Pandangan ini selari dengan gagasan UNESCO yang menekankan keperluan pendidikan untuk membina keupayaan manusia menghadapi masa depan yang kompleks serta membentuk hubungan yang lebih bertanggungjawab antara manusia, ilmu dan dunia (UNESCO, 2021).

Pengalaman melalui '*BioGlobal: Science Beyond Boundaries 2026*' di Batam, Indonesia memperlihatkan bagaimana pembelajaran di luar bilik kuliah boleh melengkapkan pendidikan formal yang diterima di universiti. Program anjuran Persatuan Ijazah Sarjana Muda Biologi (BIOSMARTEAM), Universiti Teknologi MARA (UiTM) Cawangan Negeri Sembilan Kampus Kuala Pilah itu disertai oleh 27 mahasiswa, selain membuka ruang kerjasama dengan mahasiswa dan ahli akademik Universitas Internasional Batam (UIB).



Mahasiswa UiTM Kuala Pilah dan Universitas Internasional Batam bekerjasama dalam aktiviti BioGlobal 2026 yang menjadikan pengalaman antarabangsa sebagai sebahagian daripada proses pembelajaran.

Bagi mahasiswa biologi, biodiversiti merupakan konsep teras yang amat lazim dan fundamental. Mereka mempelajari klasifikasi tumbuhan, ekologi dan interaksi organisma melalui kuliah serta kerja makmal. Namun, pengetahuan yang dipelajari di dalam kelas memperoleh makna yang berbeza apabila mahasiswa berada dalam ekosistem tertentu. Melalui '*EcoFlora Batam: Batam Biodiversity Exploration*' di Kebun Raya Batam, mahasiswa UiTM dan UIB menjalankan aktiviti pengenalpastian serta penamaan tumbuhan. Pengalaman itu membawa pembelajaran daripada helaian nota kepada persekitaran sebenar. Bilik kuliah menyediakan asas teori, manakala kerja lapangan menguji keupayaan mahasiswa menggunakan pengetahuan tersebut apabila berhadapan dengan situasi sebenar. Pendekatan ini sejajar dengan konsep pembelajaran berasaskan pengalaman, yang melihat pengalaman, pemerhatian, refleksi dan aplikasi sebagai sebahagian daripada proses pembelajaran (Kolb, 1984).

Pembelajaran menjadi lebih nyata menerusi program '*EcoCoast Serip: Mangrove Education and Community Conservation*' di Desa Wisata Kampung Tua Bakau Serip. Mahasiswa diberi pendedahan mengenai kepentingan ekosistem mangrove kepada kawasan pesisir sebelum bersama-sama menanam 50 pokok bakau sebagai sebahagian daripada aktiviti pemuliharaan. Nilai pendidikan aktiviti ini bukan sekadar pada bilangan pokok yang ditanam. Lebih penting, mahasiswa bergerak daripada memahami konsep ekologi kepada pengalaman mengambil bahagian sendiri dalam tindakan pemuliharaan. Pendidikan untuk kelestarian memerlukan mahasiswa membangunkan bukan sahaja pengetahuan, tetapi juga keupayaan berfikir secara sistem, bekerjasama dan merancang tindakan terhadap cabaran kelestarian (Wiek et al., 2011).

Masa depan pendidikan bersifat kolaboratif

BioGlobal 2026 turut memperlihatkan bahawa cabaran dunia tidak mengenali sempadan negara. Kemerosotan biodiversiti dan perubahan iklim, misalnya, memerlukan kerjasama merentas institusi dan negara. Program mobiliti antarabangsa berpotensi menyumbang kepada perkembangan akademik, peribadi dan kesedaran budaya mahasiswa apabila pengalaman tersebut direka dengan objektif pembelajaran yang jelas (Roy et al., 2019).

Komponen akademik BioGlobal diperkukuh melalui '*EduConnect Batam: Academic Collaboration and International Seminar*'. Pensyarah UiTM dan UIB berkongsi hasil penyelidikan, manakala mahasiswa daripada kedua-dua universiti melakukan pembentangan berdasarkan pengalaman serta pemerhatian yang diperoleh daripada aktiviti lapangan. Pengalaman ini penting kerana pendidikan sains bukan hanya berkaitan pengumpulan data. Keupayaan menjelaskan pemerhatian, berkongsi idea dan berkomunikasi dengan khalayak berbeza juga merupakan kompetensi penting seorang graduan sains. Pembentangan dalam persekitaran antarabangsa memberi peluang kepada mahasiswa meningkatkan keyakinan serta kemahiran komunikasi akademik.

Pada masa yang sama, pendidikan tidak terhenti pada disiplin akademik. Graduan masa hadapan juga perlu mampu berinteraksi dengan masyarakat yang mempunyai budaya dan pengalaman berbeza. Mahasiswa UiTM memperkenalkan budaya Malaysia melalui persembahan Legenda Mahsuri kepada mahasiswa UIB, manakala mereka sendiri mempelajari budaya masyarakat Batam melalui pengalaman di Saung Budaya Batam. Delegasi juga turut meneroka warisan tempatan melalui kunjungan ke Masjid Agung Raja Hamidah, Masjid Cheng Ho, Masjid Sultan Mahmud Riayat Shah dan Masjid Tanjak. Pengalaman tersebut memberi peluang kepada mahasiswa untuk melihat bagaimana budaya, sejarah dan agama membentuk identiti masyarakat.

Pendidikan untuk masa hadapan

Pengalaman antarabangsa membawa mahasiswa keluar daripada rutin yang biasa. Mereka perlu menyesuaikan diri dengan persekitaran baharu, berkomunikasi dengan individu yang baru dikenali dan menyelesaikan aktiviti bersama-sama. Pengalaman BioGlobal 2026 mengingatkan kita bahawa bilik kuliah tetap penting, tetapi ia bukan satu-satunya ruang pendidikan. Kuliah menyediakan asas ilmu. Makmal membolehkan mahasiswa menguji idea. Persekitaran sebenar pula menunjukkan bagaimana ilmu tersebut berfungsi apabila berinteraksi dengan masyarakat dan alam sekitar. Di sinilah makna '*Science Beyond Boundaries*' menjadi lebih luas. Pendidikan yang bermakna terjadi apabila ruang-ruang ini dapat dihubungkan satu sama lain. Pendidikan membentuk cara manusia memahami dunia. Lebih penting lagi, pendidikan membentuk cara manusia bertindak terhadap dunia yang mereka fahami. Sebab itulah pendidikan bukan sekadar persediaan untuk masa hadapan. Pendidikan membentuk masa hadapan itu sendiri.

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Resiliensi Bakat Graduan Generasi Muda dalam Menghadapi Cabaran Dunia Pekerjaan Baharu

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Landskap ekonomi global dan pasaran kerja tempatan sedang mengalami gelombang transformasi yang drastik dalam sejarah moden. Kemajuan teknologi yang pesat, adaptasi kecerdasan buatan (*AI*) secara meluas, serta fenomena ketidaktentuan pasaran telah merombak struktur industri pekerjaan di Malaysia (*World Economic Forum*, 2023). Sistem pendidikan tinggi pada masa kini turut berada dalam fasa penyesuaian yang ketara. Pelbagai inisiatif digital, modul pembelajaran fleksibel, dan silibus berorientasikan kemahiran abad ke-21 diperkenalkan untuk merapatkan jurang antara bilik kuliah dan tuntutan pasaran (*Talent Corporation Malaysia,* 2022). Graduan hari ini yang melangkah keluar ke dunia pekerjaan bukan sahaja menuntut kelayakan akademik, malah keupayaan untuk bernavigasi dalam ekosistem yang sentiasa berubah dan penuh dengan persaingan sengit amat diperlukan. Maka di sinilah jurang antara ilmu teori akademik dan realiti dinamik industri mula teruji, dan elemen *resiliensi* diri (daya tahan emosi dan mental) muncul sebagai pembeza utama dalam kebolehpasaran bakat muda atau pekerja baharu (*Harvard Business Review*, 2022).

Resiliensi bakat merujuk kepada keupayaan individu untuk menyesuaikan diri, bertindak balas secara positif terhadap perubahan, bangkit daripada kemunduran serta membangunkan semula keupayaan diri apabila berhadapan dengan cabaran kerjaya. Pada awalnya, *Resiliensi* bermula apabila graduan bersikap terbuka untuk *unlearn* (meninggalkan kebiasaan lama) dan *relearn* (belajar semula) kemahiran baharu secara kendiri tanpa bergantung sepenuhnya kepada apa yang diperlajari semasa di menara gading termasuklah keupayaan untuk melihat perubahan semasa sebagai dorongan kepada pembelajaran, peningkatan kemahiran dan penciptaan peluang baharu (Dweck, 2006).



Cabaran Baharu Graduan Generasi Muda

Perkembangan teknologi digital, kecerdasan buatan, automasi dan perubahan model pekerjaan telah mengubah bukan sahaja jenis pekerjaan yang tersedia, tetapi juga kemahiran yang diperlukan oleh organisasi (*World Economic Forum*, 2023). Pada masa yang sama, organisasi pada era ini semakin menuntut pekerja yang mampu belajar dengan pantas, menyesuaikan diri dengan teknologi baharu dan memberikan nilai yang tidak mudah digantikan oleh teknologi. Perubahan ini memberikan cabaran yang besar kepada generasi muda, khususnya graduan yang baru memasuki pasaran pekerjaan (*Khazanah Research Institute*, 2018). Persoalan yang semakin penting bukan lagi sekadar *"Adakah graduan mempunyai kelayakan untuk mendapatkan pekerjaan?"*, tetapi *"Adakah graduan mempunyai keupayaan untuk kekal relevan apabila pekerjaan dan keperluan industri berubah?"* Persoalan ini membawa kepada kepentingan konsep *resiliensi* bakat. *Resiliensi* bukan bermaksud sekadar bertahan dalam pekerjaan, tetapi mempunyai keupayaan untuk menyesuaikan diri (*adapt),* belajar (*learn),* pulih dari kegagalan *(recover)* and berkembang (*grow)* sepanjang perjalanan kerjaya (*Harvard Business Review*, 2022).

Daya Tahan Mendepani Persaingan

Pasaran pekerjaan yang semakin kompetitif menyaksikan graduan bertanding bukan sahaja dari segi purata nilai gred kumulatif (PNGK), tetapi juga dari segi pengalaman industri, rangkaian hubungan (*networking*), dan penjenamaan diri (*personal branding*) (*Talent Corporation Malaysia,* 2022). Berdasarkan Twenge (2023), dalam proses ini, pengalaman berdepan saringan temu duga yang gagal, penolakan permohonan, atau tempoh menunggu yang panjang boleh menjejaskan keyakinan diri dan kesejahteraan emosi graduan. Di sinilah letaknya perbezaan antara graduan biasa dengan graduan yang berdaya tahan. Dalam konteks *resiliensi*, kegagalan tidak dilihat sebagai penamat potensi diri; sebaliknya, ia diyakini sebagai maklum balas kerjaya (*career feedback*) (Dweck, 2006). Graduan yang *resilient* tidak akan mengemukakan soalan yang melumpuhkan semangat seperti *"Mengapa saya tidak pernah berjaya?"*, sebaliknya menukar perspektif kepada soalan yang membina:

"Apakah pengajaran daripada kegagalan ini dan bagaimana saya boleh memperbaiki persembahan saya pada masa akan datang?"

Perubahan orientasi pemikiran ini menjadi asas kukuh dalam pembentukan daya tahan kerjaya jangka panjang (Dweck, 2006).

Revolusi Pemikiran

Persediaan untuk melangkah ke alam pekerjaan memerlukan motivasi yang berterusan untuk mendepani sebarang penolakan dan ketidaktentuan. Revolusi minda graduan bermula dengan menerima proses pembentukan (*embracing the process*) sekaligus menyedari bahawa kejayaan kerjaya tidak berlaku dengan drastik, sebaliknya setiap kesukaran awal merupakan fasa wajib yang membentuk kematangan profesional (Harvard Business Review, 2022). Seterusnya, tumpukan perhatian kepada kawalan kendiri (*internal locus of control*), walaupun keadaan ekonomi global dan keputusan pihak HR berada di luar kawalan, usaha, disiplin, serta sikap peribadi kekal sepenuhnya di bawah kawalan diri sendiri (Dweck, 2006). Akhirnya, bina identiti yang melebihi keperluan kemahiran jawatan, di mana nilai diri tidak diukur pada gelaran semata-mata, sebaliknya terukir pada integriti, ketekunan, dan komitmen untuk sentiasa belajar.

Kejayaan pasca-graduasi dalam industri moden tidak lagi dinilai berdasarkan kelayakan akademik pada pengajian diploma atau ijazah semata-mata, tetapi keupayaan untuk terus beradaptasi dan memperbaharui kebolehan diri mengikut tuntutan bakat dalam industri yang diminati (*Talent Corporation Malaysia*, 2022). Bakat yang paling berharga dalam pasaran kerja hari ini bukanlah individu yang memiliki pengetahuan dan kemahiran tertinggi semata-mata, tetapi mereka yang mempunyai resiliensi yang mendalam untuk mengubah badai perubahan menjadi batu loncatan menuju kecemerlangan kerjaya (*World Economic Forum*, 2023).

"Potensi tanpa ketahanan diri umpama layang-layang tanpa angin. Di sebalik ketidakpastian dunia moden, biarlah resiliensi menjadi sayap yang membawa bakat generasi muda terbang lebih tinggi."

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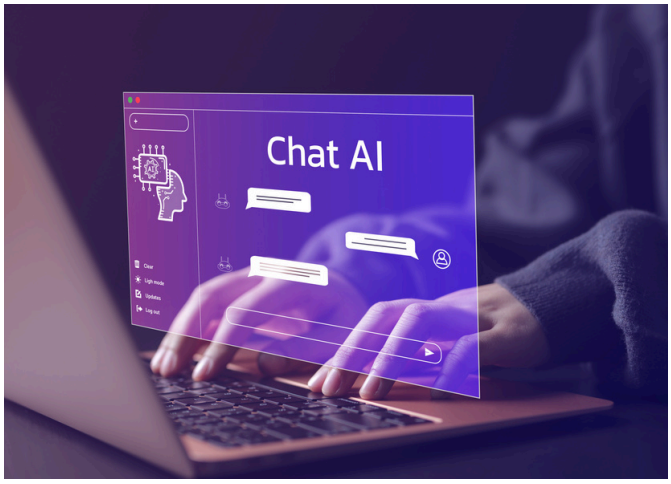
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Teknologi *AI* Dalam Pendidikan: Dari Sudut Pandang Pustakawan

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Artificial intelligence (*AI)* atau kecerdasan buatan – satu topik yang sering berlegar di ruang media sosial, forum atau penerbitan akademia sejak kebelakangan ini. Teknologi *AI* tidak lagi asing dalam kalangan masyarakat Malaysia, malah penggunaannya dilihat memberangsangkan apabila data menunjukkan Malaysia berada di kedudukan kedua tertinggi dalam kalangan negara-negara ASEAN sebagai peneraju digital dan dalam penggunaan kecerdasan buatan (Bernama, 2025). Namun begitu, di sebalik kecanggihan dan keterbukaan akses kepada teknologi *AI*, persoalan yang sering bermain di fikiran ialah bagaimana *AI* memberi kesan terhadap aspek pendidikan.



Pihak kerajaan melalui Kementerian Pendidikan Tinggi (KPT) juga dilihat amat cenderung ke arah mengaplikasikan teknologi ini di dalam sektor pendidikan mahupun melalui tugasan harian penjawat awam. Memetik daripada dada akhbar, KPT turut menetapkan semua universiti untuk mengintegrasikan elemen kecerdasan buatan di dalam kurikulum sedia ada sebagai sebahagian daripada proses pembelajaran merentas bidang pengajian (Berita RTM, 2026). Susulan itu, KPT turut melanggan aplikasi Gemini dan Scopus AI untuk semua universiti awam di Malaysia.

Dewasa ini, penggunaan teknologi *AI* di dalam sesi pengajaran dan pembelajaran (P&P) dilihat sudah sebati dalam kalangan pendidik mahupun pelajar. Justeru itu, perpustakaan akademik seperti Perpustakaan Tun Abdul Razak (PTAR), memainkan peranan penting sebagai hab rujukan berwibawa yang menyokong kepada pengetahuan dan penyelidikan berkualiti serta memelihara integriti maklumat dalam kalangan pengguna perpustakaan.

Peranan Perpustakaan

Teknologi kecerdasan buatan atau *AI* terbukti dapat membantu para pendidik serta pelajar dalam proses pencarian maklumat. Walaupun dilihat lebih mudah berbanding mendapatkan maklumat melalui kaedah konvensional, namun; tanpa pengetahuan, kemahiran dan etika yang betul, pengguna berisiko terdedah kepada maklumat yang salah atau *bias*. Justeru itu, perpustakaan akademik memainkan peranan yang penting dalam mendidik pengguna untuk mendapatkan maklumat yang tepat, sahih, terkini dan relevan, walaupun menggunapakai teknologi *AI* di dalam pencarian sumber maklumat.

Perpustakaan menerusi perkhidmatan dan konsultasi kemahiran literasi maklumat bersama pustakawan dilihat mampu meliterasikan pengguna terhadap kepentingan serta pengurusan maklumat yang berkesan. PTAR UiTM Negeri Sembilan khususnya menawarkan kursus etika penggunaan *AI* dalam persiapan kerja kursus dan penyelidikan sebagai salah satu usaha untuk memastikan penggunaan aplikasi *AI* yang bijak, betul dan beretika. Menerusi kursus seperti ini, pengguna diberi pendedahan bagaimana teknologi *AI* berfungsi, serta peralatan atau kaedah yang boleh digunakan dalam menjadikan AI sebagai alat bantu dalam proses pembelajaran dan penyelidikan mereka.

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Selain itu, pengguna turut diajar contoh prompt (atau arahan) yang bersesuaian untuk memastikan maklumat yang dihasilkan oleh AI menepati keperluan pengguna. PTAR menerusi insiatif perpustakaan digital turut mengaplikasikan teknologi AI dalam menyediakan perkhidmatan perpustakaan digital yang lebih baik dan mesra pengguna. Penggunaan aplikasi chatbot dan fungsi carian *AI* di dalam portal PERMATA serta langganan kepada perisian *Quillbot* dan *Turnitin* merupakan antara usaha perpustakaan dalam membudayakan teknologi AI, seiring dengan keperluan akademik masa kini.

Peranan Pengguna

Walaupun teknologi AI ini dilihat memudahkan, penggunaannya perlulah berlandaskan prinsip dan etika yang betul. Biarpun buat masa ini tiada klausa yang menghalang penggunaan teknologi AI dalam proses pembelajaran, baik oleh pendidik mahupun pelajar, namun begitu, adalah menjadi tanggungjawab pengguna untuk memastikan penggunaan teknologi *AI* hanyalah semata-mata "membantu", bukan "menggantikan". Justeru itu, pengguna harus mengambil beberapa langkah penting dalam mengaplikasikan AI dengan betul.

Antaranya, pengguna perlu sentiasa menjadikan *AI* sebagai alat bantu dan tidak terlalu bergantung pada fungsi atau sumber maklumat yang dihasilkannya. Perkara ini merujuk semula kepada kemahiran dan pengetahuan tentang literasi maklumat yang dapat membantu pengguna menentukan kriteria bagi sesuatu sumber maklumat yang dihasilkan oleh *AI*. Ia dilihat dapat membantu mengurangkan penyebaran maklumat yang salah, seterusnya mendidik pengguna untuk mengurus maklumat dengan lebih baik. Secara tidak langsung, kesedaran pengguna terhadap sumber maklumat yang dijana oleh AI dapat membantu meningkatkan tahap kecerdasan *AI* dalam menyampaikan maklumat yang lebih tepat pada masa hadapan.

Secara tuntasnya, kita tidak lagi terkecuali daripada menggunakan teknologi AI, walau dalam bidang pendidikan mahupun dalam kehidupan seharian. Teknologi ini dilihat semakin berkembang, semakin terbuka, dan semakin cerdas. Oleh itu, sebagai pengguna, kita perlu menjadi lebih bijak dalam memastikan pengaplikasian teknologi tersebut adalah ke arah yang positif dengan menjadikannya sebagai alat, bukan sebaliknya.



Gambar 1
Semasa Bengkel Pemantapan Tesis: Plagiarism & AI in Academic Writing

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Makerspace di Perpustakaan: Daripada Ruang Membaca kepada Ruang Mencipta

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Apabila berbicara tentang perpustakaan, gambaran yang lazim terlintas ialah deretan rak buku, meja bacaan dan suasana yang tenang. Perpustakaan telah lama berperanan sebagai tempat untuk memperoleh maklumat, membaca dan melaksanakan aktiviti pembelajaran. Walau bagaimanapun, perkembangan teknologi serta perubahan dalam cara masyarakat belajar telah membawa perpustakaan ke fasa baharu. Pada masa ini, perpustakaan bukan sahaja menyediakan ruang untuk membaca dan mendapatkan maklumat, malah turut berkembang sebagai tempat untuk berbincang, berkongsi idea, bereksperimen dan mencipta. Salah satu perkembangan yang mencerminkan transformasi ini ialah kewujudan ruang *makerspace* di perpustakaan.

Apa Itu Makerspace?

Secara umumnya, makerspace ialah ruang yang menyediakan peluang kepada pengguna untuk mempelajari, meneroka dan menghasilkan sesuatu dengan menggunakan pelbagai peralatan, teknologi dan bahan. Makerspace boleh dilengkapi dengan pencetak 3D, komputer, peralatan robotik, perisian reka bentuk, kamera serta peralatan multimedia.



Namun demikian, makerspace tidak semestinya memerlukan teknologi yang mahal dan canggih. Aktiviti seperti kraftangan, jahitan, penerbitan video dan podcast, fotografi, coding, reka bentuk grafik serta projek Do It Yourself (DIY) juga boleh menjadi sebahagian daripada makerspace. Kekuatan makerspace bukan sahaja terletak pada kecanggihan peralatannya, malah pada peluang yang diberikan kepada pengguna untuk belajar melalui aktiviti penciptaan.

Chakraborty dan Chakraborty (2021) menganggap *makerspace* sebagai dimensi baharu dalam perkhidmatan perpustakaan. Perpustakaan tidak lagi sekadar berfungsi sebagai tempat yang menyediakan bahan bercetak atau digital, malah turut berkembang menjadi ruang yang menyokong kreativiti dan penciptaan pengetahuan.

Daripada Membaca kepada Mencipta

Kewujudan *makerspace* tidak mengurangkan kepentingan fungsi membaca. Sebaliknya, makerspace melengkapi fungsi sedia ada perpustakaan. Pengetahuan yang diperoleh melalui buku, jurnal atau pangkalan data dapat dijadikan asas untuk menghasilkan sesuatu yang baharu.

Sebagai contoh, seorang pelajar boleh mendapatkan maklumat tentang reka bentuk daripada sumber perpustakaan, menggunakan perisian untuk membangunkan model, dan seterusnya menghasilkan prototaip melalui pencetak 3D. Pelajar lain pula mungkin mengaplikasikan pengetahuan yang

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diperoleh untuk menghasilkan podcast, video, poster digital atau projek kreatif. Dengan adanya *makerspace*, proses pembelajaran berkembang daripada mencari, membaca, dan memahami kepada berkongsi, mencuba, dan akhirnya mencipta.

Konsep ini berkait rapat dengan pembelajaran melalui amali (*learning by doing*). Pengguna belajar melalui pengalaman langsung dengan mencuba, melakukan kesilapan, menyelesaikan masalah dan menambah baik hasil kerja. Haruna dan Kiran (2023) turut menunjukkan kepentingan motivasi intrinsik dan penglibatan dalam pembelajaran terhadap persepsi pelajar tentang kegunaan makerspace. Hal ini menunjukkan bahawa pengalaman pembelajaran di *makerspace* sama pentingnya dengan teknologi yang disediakan.

Ruang yang Menghubungkan Idea dan Manusia

Makerspace turut berfungsi sebagai ruang yang menyediakan peluang untuk kolaborasi. Idea tidak semestinya lahir melalui pembelajaran secara individu, sebaliknya boleh tercetus melalui perbincangan, perkongsian pengalaman dan kerjasama antara pengguna daripada latar belakang yang berbeza.

Dalam perpustakaan akademik, misalnya, makerspace boleh menjadi titik pertemuan bagi pelajar daripada pelbagai bidang untuk menghasilkan projek bersama. Pembelajaran dalam makerspace juga boleh berlangsung secara formal dan tidak formal. Sesetengah pengguna memerlukan bengkel dan panduan, manakala pengguna lain belajar melalui rakan sebaya atau proses mencuba sendiri (Einarsson & Hertzum, 2019).

Dalam konteks negara membangun, *makerspace* turut berpotensi menyokong pembangunan kapasiti melalui kreativiti, pemikiran kritis, komunikasi, kolaborasi dan kemahiran menyelesaikan masalah (Okuonghae & Nkiko, 2021).

Bagaimana pula dengan perpustakaan di Malaysia?

Konsep *makerspace* bukan lagi sesuatu yang asing dalam landskap perpustakaan di Malaysia. Beberapa perpustakaan telah menyediakan ruang yang mengintegrasikan pembelajaran, kreativiti, teknologi dan inovasi.

Makerspace@Library di Pustaka Raja Tun Uda, Shah Alam, di bawah Perbadanan Perpustakaan Awam Selangor (PPAS), merupakan salah satu contohnya. *Makerspace* ini diwujudkan pada penghujung tahun 2020 sebagai ruang untuk pembelajaran, penciptaan inovasi dan penerokaan teknologi. Antara kemudahan dan aktiviti yang disediakan termasuk pencetak 3D, robotik, Arduino dan projek *Do-It-Yourself* (DIY), serta program yang berteraskan pendekatan STEAM *(Science, Technology, Engineering, Arts and Mathematics)* (Perbadanan Perpustakaan Awam Selangor [PPAS], 2022).

Dalam persekitaran perpustakaan akademik, Perpustakaan Tunku Tun Aminah, Universiti Tun Hussein Onn Malaysia (UTHM), turut menyediakan *makerspace*. Ruang yang terletak di Aras 3 perpustakaan ini direka untuk menyokong aktiviti *amali* yang melibatkan pembelajaran, penerokaan, perkongsian dan pembangunan projek inovatif (Perpustakaan Tunku Tun Aminah, 2023).

Xiamen University Malaysia Library pula menyediakan makerspace di Library 1F Innovation Space. Ruang ini menyokong aktiviti penciptaan, reka cipta dan pembelajaran secara kolaboratif, dengan penekanan pada STEM, kreativiti, pemikiran kritis dan pembelajaran amali (Xiamen University Malaysia Library, 2026).

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Contoh-contoh ini menunjukkan bahawa transformasi ruang perpustakaan daripada tempat membaca kepada ruang mencipta bukan sekadar konsep yang diamalkan di luar negara, malah telah mula diterapkan dalam perkhidmatan perpustakaan di Malaysia.

Apabila Peranan Pustakawan Turut Berubah

Perubahan fungsi ruang turut mempengaruhi peranan pustakawan. Dalam persekitaran makerspace, pustakawan bukan sahaja membantu pengguna mendapatkan maklumat tetapi juga boleh bertindak sebagai fasilitator yang menghubungkan pengguna dengan sumber, teknologi dan peluang pembelajaran.



Ini tidak bermakna pustakawan perlu menjadi pakar dalam semua teknologi yang terdapat di makerspace. Apa yang lebih penting ialah kesediaan untuk belajar, menyesuaikan diri dan bekerjasama. Koh dan Abbas (2015) mengenal pasti kebolehan belajar, berkolaborasi, mengurus program, menggunakan teknologi dan memfasilitasi pembelajaran sebagai antara kompetensi yang relevan kepada ruang persekitaran makerspace. Peranan pustakawan bukan lagi sekadar pengurus koleksi dan ruang, tetapi turut mencakupi pemudahcara kepada pembelajaran dan penciptaan pengetahuan.

Mengurus Makerspace: Lebih Daripada Membeli Peralatan

Daripada perspektif pengurusan, proses mewujudkan *makerspace* bukan sekadar menyediakan sebuah ruang dan membeli peralatan. Persoalan utama yang perlu ditanya ialah: “Apakah yang sebenarnya diperlukan oleh komuniti pengguna kita?”.

Tidak semua perpustakaan memerlukan *makerspace* yang sama. Perpustakaan akademik memberi tumpuan kepada pembelajaran, penyelidikan dan inovasi, manakala perpustakaan awam mungkin lebih menekankan kreativiti, literasi digital dan pembangunan kemahiran dalam komuniti.

Pengurusan *makerspace* perlu mengambil kira objektif, kumpulan sasaran, ruang, peralatan, kos penyelenggaraan, keselamatan, latihan staf dan program yang akan dilaksanakan. Ia juga tidak perlu bermula secara besar-besaran. Sebuah ruang kecil yang dilengkapi dengan peralatan asas boleh menjadi titik permulaan sebelum berkembang berdasarkan keperluan, kemampuan dan sambutan pengguna.

Perpustakaan yang Terus Berkembang

Kewujudan *Makerspace* menunjukkan bahawa perpustakaan mampu berkembang seiring dengan perubahan teknologi dan keperluan masyarakat tanpa meninggalkan fungsi asasnya sebagai pusat ilmu. Buku dan amalan membaca serta akses kepada maklumat tetap penting. Apa yang berubah ialah bagaimana ruang, sumber dan kepakaran perpustakaan digunakan untuk memberikan pengalaman pembelajaran yang lebih luas.

Makerspace akhirnya bukan semata-mata tentang pencetak 3D, komputer atau robotik. Ia tentang manusia, idea, kreativiti, pembelajaran, dan keberanian untuk mencuba sesuatu yang baharu. Daripada ruang membaca kepada ruang mencipta, perpustakaan bukan sahaja menyediakan ruang untuk menemukan pengetahuan, tetapi turut membuka peluang untuk menggunakan pengetahuan tersebut bagi mencipta, bereksperimen, berkolaborasi dan menghasilkan sesuatu yang baharu.

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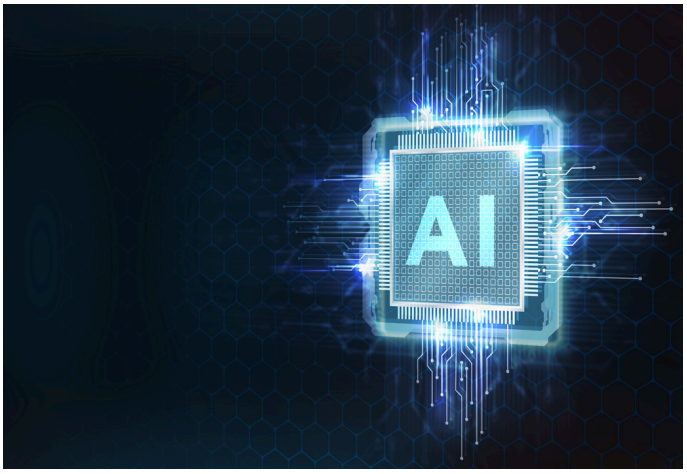
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Kecerdasan Buatan (AI) dan Akses Pendidikan: Memudahkan Pembelajaran Pelajar OKU di Institusi Pengajian Tinggi

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Pengenalan

Pendidikan tinggi yang inklusif perlu mengambil kira keperluan pelajar Orang Kurang Upaya (OKU), termasuk mereka yang menghadapi halangan penglihatan, pendengaran, pergerakan dan pembelajaran. Kecerdasan buatan (AI) menawarkan pelbagai cara untuk menjadikan bahan dan aktiviti akademik lebih mudah diakses. Sorotan kajian oleh Melo-López et al. (2025) menunjukkan potensi AI dalam meningkatkan kebolehcapaian dan menyesuaikan pembelajaran, namun turut mengingatkan tentang cabaran kos, latihan dan privasi.



1. Penukaran Teks dan Suara

Teknologi penukaran teks kepada suara (*text-to-speech*) boleh membantu pelajar yang sukar membaca teks bercetak, manakala penukaran suara kepada teks (*speech-to-text*) membolehkan rakaman pertuturan dijadikan transkrip atau sari kata. AI juga boleh membantu menghasilkan penerangan imej untuk bahan visual. Menurut Melo-López et al. (2025), bahan seperti deskripsi imej dan transkrip audio merupakan antara aplikasi yang menyokong pendidikan inklusif. Contohnya, pelajar yang mempunyai masalah penglihatan boleh mendengar nota digital, sementara pelajar yang mempunyai masalah pendengaran boleh merujuk kepada transkrip kuliah. Namun, ketepatan transkrip dan penerangan visual masih perlu disemak.

2. Pembelajaran Adaptif dan Diperibadikan

AI boleh dimanfaatkan untuk menyediakan latihan, maklum balas dan bahan pembelajaran yang lebih sesuai dengan keperluan setiap individu. Sebagai contoh, murid yang mengalami kesukaran membaca boleh dibantu melalui penyediaan bahan audio interaktif agar mereka dapat memahami kandungan pelajaran dengan lebih mudah tanpa berasa terpinggir di dalam kelas. Satu kajian tinjauan menyeluruh oleh Paglialunga dan Melogno (2025) melaporkan bahawa penggunaan AI memberikan kesan positif kepada pelajar yang mengalami masalah pembelajaran. Walau bagaimanapun, bukti sedia ada masih terhad akibat kekangan metodologi kajian. Rentetan itu, penggunaan AI sewajarnya diposisikan sebagai alat bantuan pedagogi untuk memperkasa pengajaran pensyarah, dan bukannya menggantikan fungsi pendidik sepenuhnya.

3. Kawalan Melalui Suara dan Teknologi Bantuan

Bagi pelajar yang mengalami kekangan motor halus atau keterbatasan pergerakan tangan, ciri kawalan suara dan teknologi bantuan digital dapat memudahkan pelaksanaan tugasan harian, seperti membuka dokumen, menaip teks dan menavigasi aplikasi. Dalam sorotan literatur mereka, Chalkiadakis et al. (2024) mengkaji integrasi teknologi kecerdasan buatan dan realiti maya sebagai intervensi pedagogi digital yang berpotensi memperkasa penyertaan inklusif pelajar berkeperluan khas. Sebagai contoh, pelajar boleh menggunakan fungsi imlak suara untuk menyediakan draf tugasan mereka. Walau bagaimanapun, pelaksanaannya amat bergantung pada penilaian awal terhadap tahap keserasian perisian, kebolehcapaian peranti, serta keperluan khusus setiap individu.

4. Sokongan Komunikasi untuk Pelajar Kurang Pendengaran

AI berpotensi memudahkan komunikasi melalui sari kata automatik, transkripsi dan penyelidikan dalam pengecaman bahasa isyarat. Namun, penterjemahan bahasa isyarat secara automatik tidak semestinya tepat dalam setiap situasi, kerana bahasa isyarat mempunyai struktur dan konteksnya yang tersendiri. Seperti yang dibincangkan dalam Melo-López et al. (2025) tentang kebolehcapaian, teknologi digital lebih sesuai dilihat sebagai pelengkap kepada kemudahan sedia ada. Dalam sesi pembentangan, sari kata langsung boleh membantu sesetengah pelajar, sementara khidmat jurubahasa isyarat mungkin tetap diperlukan.

5. Pengesanan Cabaran Pembelajaran

Sistem analitik pembelajaran boleh membantu institusi mengenal pasti corak, seperti penyertaan yang semakin berkurangan dalam platform pembelajaran atau tugasan yang tidak dihantar. Khalil et al. (2023) membincangkan potensi analitik pembelajaran dalam menyokong pelajar kurang upaya, di samping isu etika dan keterangkuman yang perlu diberi perhatian. Sebagai contoh, sistem boleh menghantar peringatan mesra kepada pelajar yang terlepas tarikh penghantaran. Namun begitu, data aktiviti digital tidak seharusnya digunakan untuk mendiagnosis masalah pembelajaran atau kesihatan mental tanpa penilaian profesional dan persetujuan yang sewajarnya.

Kesimpulan

Kecerdasan buatan (AI) berpotensi mengurangkan sebahagian halangan yang dihadapi oleh pelajar OKU di institusi pengajian tinggi melalui akses kepada bahan pembelajaran, pembelajaran yang fleksibel dan sokongan komunikasi. Keberkesanannya bergantung pada reka bentuk yang mudah diakses, latihan kepada pengguna, perlindungan data, serta sokongan daripada pensyarah dan institusi. Pendekatan yang paling sesuai adalah dengan menggunakan AI sebagai alat sokongan dalam ekosistem pendidikan inklusif, sambil mengekalkan sokongan manusia dan mengambil kira keperluan sebenar setiap pelajar (Chalkiadakis et al., 2024; Melo-López et al., 2025).

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ARTIKEL

Bahasa Inggeris

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Education for a Better Future: Teaching Young Malaysians About Money

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Education as an investment

Skills acquired through education and training can boost earnings, benefiting employers and the broader economy (Blundell et al., 1999). We often encourage young people to study diligently to improve their chances of securing a good job, and that advice is sound. But what happens after the first salary arrives? A graduate may know how to earn an income yet still be unsure how to make it last. If education is meant to prepare students for adult life, then money deserves a place in that education.

Why money belongs in education

Imagine a fresh graduate earning RM2,500 a month. Rent, transport, food, and a student loan may leave little cash. Should they take a payment plan for a new phone? How much could they save? A lesson built around these questions feels more useful than a list of financial terms. Financial capability involves knowledge, behaviour, and access to suitable financial services (Xiao et al., 2022). Students need a chance to practise all three.

This matters in Malaysia, where a study of young adults linked financial knowledge and behaviour to financial strain and financial well-being (Sabri et al., 2021). A young person may understand the idea of saving but still struggle to set money aside each month. Financial education should start with practical skills: tracking one week of spending, comparing the full cost of borrowing, and deciding what to do when an unexpected bill arrives.



Lessons that students can practise

An effective financial education lesson engages students in practical activities. For example, provide the class with a monthly budget and ask them to allocate funds for meals, transportation, mobile data, and emergencies. Then, change the scenario: the laptop breaks, or a part-time shift is cancelled. What would they adjust? A review of financial education programmes found improvements in knowledge and attitudes and identified practical learning as a promising approach (Amagir et al., 2017). The exercise also lets students make mistakes safely, before real money is at stake.

Practice can build confidence. Someone who successfully follows a modest spending plan may feel more able to handle the next financial choice. In a study of employees, financial literacy was linked with financial well-being partly through financial self-efficacy and behaviour (Rai et al., 2025). This does not mean one workshop will solve every money problem. It suggests that lessons should help students use what they learn and return to it as their responsibilities grow.

Learning beyond the classroom

The examples must also fit the way young Malaysians work. A delivery rider or freelancer may be paid unevenly from month to month. Saving a fixed amount every payday may be unrealistic; planning around quieter months could help. Malaysian research found that gig workers value accessible, flexible social insurance for risks such as injury and income loss (Ghorpade et al., 2024). Lessons for this group could cover irregular earnings, emergency savings, and where to find suitable protection.

Families can instil money habits, schools can provide students with a safe place to practise, and universities can use the choices students already face, such as managing an allowance or repaying a loan. Learning should continue as people enter the workforce. A young Malaysian who can interpret a payslip, assess the total cost of credit, and prepare for emergencies is better equipped to plan effectively. That is a practical expression of education's role in building a better future and, in a modest yet meaningful way, *berkhidmat untuk negara*.



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Beyond Diet Trends: Fueling the Body and Mind

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Food Literacy for the Future

A few minutes on social media is enough for one to encounter many food rules: 'stop eating meat', 'avoid carbohydrates', 'eat only within eight hours', or 'switch entirely to plant-based foods'. Vegan, vegetarian, pescatarian, ketogenic (keto), and intermittent fasting have become familiar terms, especially among young adults. Yet popularity does not equal understanding. Under the theme *Education for a Better Future*, food literacy matters because our daily choices can shape health, learning, productivity, and long-term well-being.

For students, nutrition education should go beyond asking, "Which diet is best?" Instead, they should consider whether a dietary approach supports their energy, concentration, learning, and overall well-being. The World Health Organization (2026) emphasises adequacy, balance, moderation, and diversity as core principles of a healthy diet. These principles provide a useful lens for understanding popular eating patterns without treating any label as a magic solution.

Five Popular Approaches to Eating

Vegan: Fully Plant-Based Living

A vegan diet excludes meat, fish, eggs, dairy products, and other animal-derived foods. It is centred on vegetables, fruits, beans, lentils, tofu, tempeh, nuts, seeds, and grains. For students, the key issue is not simply eating plant-based foods but ensuring that the diet provides enough nutrients to support both physical and mental demands. Nutrients such as vitamin B12, iron, iodine, vitamin D, and omega-3 fats support normal brain and body function, yet some may require greater attention in a vegan diet (Neufingerl & Eilander, 2022). Poor planning may contribute to tiredness or reduced well-being, making sustained learning more challenging. A well-planned vegan diet, however, can provide a wide variety of nutrient-rich foods while supporting cardiovascular health (Landry et al., 2024).

Vegetarian: Plant-Focused with More Flexibility

Vegetarian eating is broader than vegan eating. Most vegetarians avoid meat and fish but may consume eggs and dairy products (Neufingerl & Eilander, 2022). This flexibility can make it easier to obtain nutrients such as protein, vitamin B12, calcium, and iron. For students, this matters because regular meals with adequate protein, whole grains, fruits, and vegetables can support energy during lectures, study sessions, and assessments. However, being vegetarian does not automatically mean eating healthily. A diet dominated by fried foods, sugary drinks, refined carbohydrates, and ultra-processed snacks can still be nutritionally poor. The lesson for students is simple: the label matters less than what is actually on the plate.



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Pescatarian: Plant-Based Eating with Seafood

A pescatarian diet is mainly plant-based but includes fish and seafood while excluding meats such as beef, chicken, and lamb. From a student-learning perspective, one interesting feature is that it includes fish as a source of protein and long-chain omega-3 fatty acids. These nutrients support normal brain structure and function, making them particularly relevant to nutrition and learning (Gómez-Pinilla, 2008). Combined with fruits, vegetables, legumes, and whole grains, a pescatarian pattern can provide a broad range of nutrients needed for everyday physical and cognitive demands. Research suggests potentially favourable health outcomes among pescovegetarian groups, although no single eating pattern should be assumed to be ideal for every student (Abris et al., 2024).

Ketogenic (Keto): Very Low Carbs, High Fat

Keto takes a very different approach. It is a high-fat, very low-carbohydrate diet designed to shift the body towards using ketone bodies as an alternative energy source. For students, however, restricting carbohydrates requires careful consideration because carbohydrate-rich foods are common energy sources in everyday diets. Some people may adapt well to keto, while others may initially experience fatigue, headaches, digestive discomfort, or difficulty maintaining the diet. These effects could be inconvenient during classes, examinations, or long study periods. Although keto may support short-term weight loss and certain metabolic outcomes, it is restrictive and may increase the risk of nutrient gaps if poorly planned (Malinowska & Żendzian-Piotrowska, 2024). For students, following a popular trend should never come at the expense of adequate nutrition and the ability to learn effectively.

Intermittent Fasting: It Is About When You Eat

Intermittent fasting focuses more on when food is eaten than on what is eaten. Popular forms include time-restricted eating, such as eating within an eight-hour window, and the 5:2 approach. For students, timing can become especially important. Skipping or delaying meals may suit some people, but others may feel hungry, have low energy, become irritable, or struggle to concentrate during lectures and study sessions. An eating window also does not guarantee nutritional quality; a student can fast for 16 hours and still eat an unbalanced diet during the remaining eight. Evidence suggests that some forms of intermittent fasting may support weight and metabolic outcomes, particularly among adults who are overweight or obese, but the effects differ between individuals (Sun et al., 2024). The educational message is therefore not simply "*when should I eat?*" but also "*am I giving my body and mind what they need to function well?*"

Feeding the Mind, Not Just Following a Trend

For students, food is part of the learning environment. The brain needs an adequate supply of energy and essential nutrients to function normally, while poor eating habits can contribute to fatigue, hunger, and difficulty maintaining attention. Protein, iron, B vitamins, omega-3 fatty acids, complex carbohydrates, fruits, vegetables, and adequate fluid intake all contribute to supporting normal physical and cognitive function (Gómez-Pinilla, 2008).

Research among college students also suggests that dietary behaviours and overall diet quality may be associated with academic achievement (Burrows et al., 2017). University life can also make healthy eating more challenging. Busy class schedules, assignments, examinations, limited budgets, and easy access to convenience foods may influence what and when students eat. Therefore, choosing a diet should not be about following the most fashionable label. It should be about building an eating pattern that provides the *"ingredients for the mind"* needed to learn, think, and perform at one's best.



Building a Better Future Through Nutrition Education

Nutrition education can help build a better future by equipping students with the knowledge and critical thinking skills to make informed food choices throughout their lives. Understanding basic principles of nutrition may help them evaluate diet trends more carefully, recognise misleading health claims, and choose eating patterns that support both physical and cognitive well-being. In the longer term, these skills can encourage healthier habits, reduce the risk of diet-related health problems, and support better learning and productivity. As students eventually become professionals, parents, and decision-makers, the ability to make sound nutritional choices can also influence the health and well-being of their families and communities (Burrows et al., 2017; World Health Organization, 2026).

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Game On! Transforming English Classrooms Through Play

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Learning English can be challenging, especially when students must learn new vocabulary, grammar rules, reading skills, and communication strategies. Traditional teaching methods may cause students to lose interest when lessons become repetitive. Therefore, teachers need to create a classroom environment that encourages active participation and makes learning enjoyable. English classrooms should widely incorporate games, as they boost student motivation, promote active participation, and support the development of English-language skills in an engaging environment.

First, games can increase students' motivation and interest in learning English. Students are more likely to pay attention and participate when lessons include enjoyable and interactive activities. Majdoub (2021) noted that gamification benefits not only students' academic performance but also their motivation. For example, teachers can use vocabulary games, quizzes, word puzzles, or language challenges to introduce and practice new words. Competition can also encourage students to put more effort into completing a task. Silalahi (2019) also noted that games can build interest and help students learn English more quickly and easily. Instead of simply memorising vocabulary from a textbook, students can learn new words while playing with their classmates. As a result, games can make English lessons more exciting and encourage students to develop a more positive attitude towards learning.

Second, games promote active participation in the classroom. In a traditional classroom, some students may stay quiet because they fear making mistakes when speaking English. According to Majdoub (2021), many games are designed to promote student engagement, creating a less stressful environment where students can communicate and interact with their classmates. For instance, role-playing games, guessing games, and group challenges require students to use English to complete a task. Students can practise speaking, listening, and responding to others while having fun. This active participation is important because students need opportunities to use English rather than simply listen to the teacher.



Third, games can help students develop their English language skills in a meaningful way. Teachers can design different types of games to practice different language skills. Vocabulary games can improve students' word knowledge, while grammar games can help students understand sentence structures. Speaking games can also improve students' fluency and confidence in using English. For example, a classroom game where students describe a picture without naming it can encourage them to use vocabulary and communication strategies. Therefore, games are not only entertainment but can also be effective teaching tools when connected to lesson objectives (Silalahi, 2019).

In conclusion, English classrooms should widely implement games because they make learning more enjoyable and meaningful. They can increase students' motivation, encourage active participation, and support the development of important English language skills. However, teachers should carefully select games and connect them to learning objectives rather than using them only for entertainment. In the article "Ways Gaming Can Support" (2024), the author reported that when games are used effectively in the classroom, students can learn more than just language and develop important skills such as critical thinking, creativity, and teamwork.



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Educating for Tomorrow: Why Good Grades Aren't Enough Anymore

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Higher education institutions in Malaysia (IPTs) have long been celebrated as the main engine of national progress, tasked with refining the intellectual capital that will power our shared future. This aspiration stems directly from the National Education Philosophy and the core frameworks governing Malaysian education, which mandate that students not only excel academically but also develop holistically—balancing intellectual capability with moral integrity, spiritual grounding, and emotional stability. Under the latest higher education talent frameworks managed by the Ministry of Higher Education (KPT) (2026), this vision is explicitly expanded into the dimensions of Embodying Values (*Menghayati Nilai*) and cultivating *Adaptable, Agile, and Resilient* mindsets. However, a troubling counter-trend in student attitude—characterised by pervasive apathy, entitlement, systemic procrastination, and a transactional view of learning—is quietly eroding this foundation. While academic credentials remain important, good grades are simply no longer enough. If students treat university education merely as an automated gateway to a certificate rather than a transformative process of character building, the vision of "Education for a Better Future" becomes an empty promise, failing to deliver the resilient leaders our nation requires.



This crisis of student attitude immediately strains university staff, directly undermining the government's intent to cultivate a supportive, values-driven academic community. Academic staff consistently report high levels of stress and burnout stemming from heavy administrative workloads, rapid digital adaptation, and the burden of managing disengaged learners (Fynn & Van Der Walt, 2023)—a reality local studies confirm is widespread across Malaysian public higher education institutions as well (Mukosolu et al., 2020). Lecturers are increasingly forced to step out of their roles as scholarly mentors to become strict disciplinarians, chasing passive students for basic assignments, managing unprovoked hostility over grades, and navigating widespread indifference in lecture halls. Public discussions on social media platforms like Threads frequently echo these frustrations, with Malaysian educators openly sharing stories of students asking for deadline extensions minutes before midnight, exhibiting a lack of accountability, or blaming staff for their own lack of preparation. When administrative hand-holding drains educators and they remain perpetually disengaged, their capacity to innovate, conduct meaningful research, and offer quality mentorship plummets. Ultimately, negative student behaviour undermines faculty mental health, weakening the entire academic infrastructure from within.

Beyond the university gates, this toxic mindset directly undermines graduates' preparedness for the modern workforce and runs counter to KPT's policy mandate to develop agile and adaptable talent. Employers across Malaysia consistently report a significant disconnect: although recent graduates may possess theoretical knowledge, they often lack essential soft skills, including personal accountability, emotional intelligence, adaptive problem-solving, and a strong professional work ethic.

Reports from the Ministry of Higher Education emphasise that a fundamental mismatch in expectations contributes to graduate underemployment: employers report that graduates lack the professional attitudes, resilience, and adaptability needed for dynamic job markets (Ong et al., 2022). An entitled attitude in the classroom can translate into reduced resilience, ineffective workplace communication, and difficulty accepting constructive criticism in corporate settings. When IPTs produce graduates who expect substantial rewards for minimal effort, the workforce may experience lower productivity and higher turnover, potentially threatening Malaysia's economic competitiveness globally.

Critics often argue that blame should not rest solely on the students, citing academic overload, economic pressures, and widespread mental health struggles as the root causes of disengagement. While these external challenges are real and demand systemic support, using them to excuse unprofessional behaviour sets a dangerous precedent that conflicts with the national goal of building resilient mindsets. Validating apathy as a natural reaction to stress deprives students of personal agency and prevents them from developing essential coping mechanisms required in adult life. Mental health support and academic empathy must coexist with high standards of personal accountability; understanding a student's struggle does not mean lowering the standards of integrity, effort, and respect required in higher education.

Ultimately, achieving a better future through education requires an immediate, collective reset of behavioural standards within Malaysian IPTs to realign with national educational blueprints. Universities must move beyond evaluating success solely through grade point averages and paper credentials and actively integrate the core values of "*Menghayati Nilai*" into daily campus culture and student evaluation. Students must recognise that public higher education is a privilege that comes with accountability, while institutions must protect their educators' mental well-being by enforcing clear boundaries against academic apathy. Higher education can fulfil its full promise only by fostering a genuine culture of mutual respect, active engagement, and personal responsibility—one that develops not just degree holders but adaptable, agile, and resilient individuals ready to shape a better future.

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Every Learner Is Different: Rethinking Education for a Better Future

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Each student has a unique story shaped by distinct experiences, abilities, confidence levels, learning motivations, and challenges. One student may be ready to speak, while another is still developing confidence. Some students learn independently, whereas others require guidance. One student may view a challenge as an opportunity, while another may perceive it as a barrier. Despite this diversity, traditional education often expects students to learn in remarkably similar ways.

In light of this, can a 'one-size-fits-all' approach to education genuinely prepare every student for what lies ahead? Perhaps a better future begins when we shift from asking students to adapt to the education system to considering how the system can better accommodate each learner.

The Limits of a 'One-Size-Fits-All' Education

For a long time, education has largely been organised around a common structure: the same curriculum, the same lessons, the same learning materials, and often the same expectations for everyone. This approach is practical. It provides structure, consistency and a shared learning experience. But consistency does not always mean effectiveness.

When students enter a classroom with different levels of prior knowledge, motivation, confidence, interests, and learning needs, the same learning experience may leave some behind while others are ready to move forward. The OECD (2021) highlights that a standardised "one-size-fits-all" approach may not sufficiently account for these differences.

Think about it this way: if every student is given the same pair of shoes, will every student walk comfortably? Education can work in much the same way. The issue is not that a common curriculum is wrong. Rather, the challenge lies in assuming that the same pathway will work equally well for everyone. A student who already understands a concept may need greater challenges. Another who is struggling with the fundamentals may need additional explanation and support. Someone else may understand the content but lack the confidence to participate. These differences matter. Research on personalised education defines personalisation as systematically adapting instruction to individual learners, rather than providing the same learning experience to everyone (Tetzlaff et al., 2021).



A mark can show whether a student has achieved an expected outcome, but it may not reveal the learning journey behind that mark. Two students can receive the same grade while needing completely different forms of support. This is why the future of education requires us to look beyond standardisation and begin thinking more seriously about personalisation.

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From One-Size-Fits-All to Personalised Learning

If every learner is different, the next step may not be to teach less but to teach differently. Personalised education begins with a simple idea: understand the learner before deciding what support they need. It does not mean preparing a completely different lesson for every student or allowing everyone to learn without structure. Instead, it means making learning more responsive to differences in students' abilities, interests, motivation, confidence, and pace of learning. In other words, the destination may be shared, but the journey does not always have to be the same.

Personalised education has long been seen as a way to adapt instruction to individual learners while maintaining meaningful educational goals (Tetzlaff et al., 2021). Systematic reviews of technology-enhanced personalised learning have similarly identified learner characteristics, learning support and learning outcomes as important dimensions of personalised and adaptive learning (Xie et al., 2019).

Imagine two students working towards the same learning outcome. One may need additional practice to strengthen understanding. Another may be ready for a more challenging task. A third may understand the content but lack the confidence to participate. Treating all three students the same way may be procedurally equal but not equally helpful. Personalised education seeks to close this gap by adapting learning to the learner. Research describes it as the systematic adaptation of instruction to individual learners, while the OECD (2021) highlights the potential of personalised approaches to respond to differences in students' needs, skills, interests and learning pace.

This shift requires us to look beyond a student's final grade. Instead of asking only, “How did the student perform?”, educators can also ask, "What does this learner need in order to progress?” The latter question changes everything. It encourages educators to see learning as a process, not just an outcome. It also opens opportunities for more targeted feedback, flexible learning activities, differentiated support, and greater student choice.

Technology can play an important role in this process. Digital learning platforms, learning analytics, and artificial intelligence can help educators identify patterns, monitor progress, and understand learners' needs. Ifenthaler and Yau (2020) found that learning analytics can support student success by providing information about student learning and enabling more informed educational interventions, although the evidence base and implementation challenges still require careful consideration.

Importantly, however, technology should remain a partner in education, not a replacement for the educator. The OECD (2021) highlights the potential of hybrid human-AI approaches in which technology supports personalisation while teachers retain an essential role in interpreting information and making pedagogical decisions.

Ultimately, personalised education is not about making learning easier. It is about making learning more purposeful. When students understand their strengths, recognise areas for improvement, and receive support that meets their actual needs, they are better positioned to take ownership of their learning.

From Marks to Meaning: Understanding the Learner

A grade is important. It tells us something about achievement. But does a grade tell us everything we need to know about a learner?

A student who earns 60 marks may have understood most of the concepts but lacked confidence. Another student with the same score may be highly motivated but have gaps in prior knowledge. A third may perform better but struggle to manage time, regulate their learning, or maintain focus. The score is the same; the learner is not.

This is why the future of education requires us to look beyond marks and begin asking better questions. *'What does the student already understand?' 'Where is the difficulty?' 'What is preventing progress?' 'What kind of support would make the greatest difference?'*

Rather than waiting until the end of a course to discover that a student is struggling, educators can gather information throughout the learning process. Formative assessment helps teachers identify students' current understanding, provide meaningful feedback, and adapt teaching to their needs. Using assessment and feedback as part of an ongoing learning process is central to effective formative assessment, especially when teachers use assessment information to modify teaching and learning rather than simply record achievement (Black & Wiliam, 2009).

Feedback matters because students need to know not only how they performed but also how they can improve. According to Hattie and Timperley (2007), effective feedback can help learners understand the gap between their current performance and the desired learning goal and identify possible ways forward.

Importantly, diagnosis does not have to focus only on academic knowledge. Learning depends on a broader set of factors. A student may know *what* to do but lack the confidence to do it. Another may have the ability but struggle to regulate their learning independently. Motivation, self-regulation and emotional factors can also shape how students engage with learning. The OECD (2021) specifically identifies motivation, self-regulation and emotion as important learner characteristics that future personalised learning technologies may need to consider.

Research by Heikkinen et al. (2023) also suggests that technology can identify aspects of students' self-regulated learning and provide interventions to support planning, performance, and reflection. However, the evidence is not uniformly positive, underscoring the need for careful pedagogical design rather than assuming technology alone will improve learning.

This changes the role of assessment. Assessment is no longer simply the finish line where students receive a grade. It can become a starting point for better support. Imagine a lecturer who knows that a group of students is struggling not because they lack ability, but because they lack confidence in applying what they have learned. The response would be very different from simply giving them more exercises. They may need encouragement, guided practice, safe opportunities to participate, and feedback that helps them recognise their own progress.

Education for a Better Future

Every learner brings different abilities, experiences, motivations, confidence, and aspirations. Recognising these differences does not mean lowering expectations or creating a separate pathway for every student. It means creating an education system that is flexible enough to respond to learners while maintaining high expectations for all.

Personalised education offers one possible way forward. It shifts our focus from simply delivering the same learning experience to everyone towards understanding what different learners need to progress. Technology can strengthen this process by helping educators identify learning patterns and provide more responsive support. At the same time, learning analytics research cautions against focusing only on data and performance indicators while overlooking the complexity of teaching and learning (Ifenthaler & Yau, 2020). The human connection between educator and learner must therefore remain at the centre of educational personalisation.

Perhaps the future we should strive for is not a classroom where every student learns in exactly the same way, but one where every student is seen, understood, supported and empowered to succeed. Because when we recognise that every learner is different, we begin to create an education system where every learner matters. That may be the first step toward a better future through education.

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You Cannot Rush a Culture: Growing Minds for a Better Future

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On the third morning, the plate finally shows something. A student who checks the incubator twice a day lifts the lid, and there they are: a dozen small, cream-coloured colonies where, the day before, there was nothing but empty agar. She looks up with an expression no lecture slide has ever produced. Nothing about that moment could be rushed, downloaded or summarised. It needed the right conditions and then time.

Years of teaching Microbiology and supervising bench-level final-year projects led to a core realisation: the laboratory is far more than a space for scientific instruction. It is the clearest operational model of the learning process, offering a prototype for what education must become to prepare students for an unpredictable future.

Setting the conditions for growth.



Microbiologists do not grow cultures. We create the environment in which growth is possible, and the organism takes care of the rest. The medium must contain the right nutrients, the temperature must stay constant, and the plate should be left alone long enough for something to appear. If you choose the wrong medium and nothing grows, nothing will grow. If you open the incubator too early, you may mistake an unfinished plate for a failed one. Teaching works in the same way, and three conditions matter most:

1. **A real problem to work on.** Students make faster progress when they face questions not already answered in a textbook. Converting spent mushroom waste—a discarded agricultural by-product—into a biofertiliser carrier for beneficial soil bacteria provides final-year students with a hands-on, uncertain learning environment. Active-learning research indicates that students who apply concepts in practice outperform those who observe passively (Freeman et al., 2014).

2. **Room to fail without penalty.** In the learning process, it is important to have space for mistakes without fear of punishment. If a student gets a contaminated plate, it shouldn't be seen as a wasted effort. It's an opportunity to investigate the technique and learn the lessons. If students are allowed to make errors and learn from them, they become scientists. If you shield them from errors, they learn to follow instructions without real understanding.

3. **Patience, held by the teacher.** As with growth curves, students also go through periods where they don't show immediate improvement. The quiet student in week three can become a confident

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presenter by week ten. Our job in these early phases is to keep the environment supportive and to resist the urge to pull them back just because nothing is showing up yet. This is a slow shift from hands-on to reflective thinking (Doutor & Alves, 2022).

Education Beyond the Lab

For students, learning does not end when they leave the lab. For example, when students culture bacteria from a chicken sample, they don't just hone their aseptic skills; they're tackling real-life problems. They learn why a night market vendor carefully controls temperatures and why halal standards matter. Our curriculum focuses on food safety, halal assurance, and sustainable agriculture. When students understand the purpose of their studies, they can see how it applies in real-life situations.

Teaching in the Age of Artificial Intelligence

Many worry that artificial intelligence will render much of what we teach irrelevant. An investigation into student perspectives on AI in the Diploma in Microbiology and the Bachelor of Science in Biology programmes reveals distinct usage patterns based on cognitive demand. Students frequently use AI tools to retrieve foundational information, yet rely far less on AI when asked to articulate and defend independent scientific judgements.

This distinction is fundamental. A language model can write a very good paragraph about Gram staining quickly. But it can't physically analyse a sample or determine whether the smear was over-decolourised. Technology takes over information retrieval, and we need to focus on what it struggles with: making judgements in uncertain situations, maintaining integrity when no one is watching, and having the patience to tackle problems without immediate solutions. UNESCO (2021) echoes this sentiment, calling for a new social contract for education, one focused on long-term human skills rather than quick content delivery.



Conclusion

Education, like a culture plate, cannot be hurried. The student who lifted the incubator lid on the third morning learned because the conditions were right and she was given time, not because someone handed her the answer. Building a better future therefore depends less on sweeping curriculum reform than on the small, meaningful choices we make in our daily teaching: asking questions that have not yet been answered, giving students room to fail, and patiently helping them learn from those failures. As artificial intelligence takes over more of the work of finding and summarising information, these choices matter even more, because no machine can supply the judgement to read an uncertain result, the integrity to report it honestly or the patience to keep going until something grows. These qualities can only be cultivated, never downloaded. Our students will graduate, and much of what they memorised will fade. What should stay with them is the

understanding that care and patience can produce something real and valuable and that it is worth nurturing. If they carry that lesson into the next stage of their lives, we will have taught them what matters most, perhaps not by the first morning but, like the colonies on the plate, in their own time.

Figure 1

Students at Work in the Microbiology Teaching Laboratory at UiTM Cawangan Negeri Sembilan, Kampus Kuala Pilah



Note. Image from the author's personal collection.

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Educating for a Changing Climate

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The haze affecting parts of Southeast Asia and the floods that recently swept through Nepal are more than passing headlines. They are a vital reminder that environmental events will not confine themselves within their historical boundaries. Instead, they reach into public health, infrastructure, livelihoods, education, and everyday life.

Students are often introduced to climate change through science or environmental subjects. However, its impacts extend far beyond these fields, affecting infrastructure, migration, food security, public health, education, and employment. Climate change is a multifaceted challenge that necessitates interdisciplinary collaboration, as it affects numerous aspects of society.



Regional haze clearly shows how environmental issues affect everyday life. Poor air quality can threaten public health, limit outdoor activities, and disrupt learning and work. Flooding can similarly damage infrastructure, interrupt education, threaten food security, and affect household incomes and livelihoods. In 2024 alone, extreme weather events such as heatwaves, storms and floods disrupted schooling for at least 242 million students across 85 countries (UNICEF, 2025). The environment is therefore not just an ecological issue but also a social, economic and educational one, requiring students to approach it from multiple perspectives.

Preparing Students for Better Futures

If climate challenges are as interconnected as they appear, raising awareness alone is not enough. Students need the skills and confidence to respond, including sustainability competence, a sense of responsibility, problem-solving skills, and the ability to imagine more desirable futures (Stifterverband, 2026). This calls for a shift in how schools teach about climate issues, moving beyond merely explaining problems to helping students explore potential responses. Importantly, this approach is not limited to science or environmental studies; schools can integrate climate education across disciplines, enabling students to examine climate challenges from scientific, social, economic, creative, and civic perspectives. Instead of asking only, “What is climate change?”, students can be encouraged to ask, “What can we do to address it?”

This approach can turn the classroom into a space for inquiry and action. For example, students could investigate how excessive heat affects their school, identify areas with limited shade and propose practical solutions such as planting trees, creating shaded spaces or improving access to drinking water. In science, they might examine temperature data; in mathematics, analyse heat trends; in language classes, develop a proposal to present to school management; and in design or technology,

develop a practical model of a cooler, more sustainable school space. Through activities like these, students learn to identify problems, evaluate evidence, weigh different solutions, consider their consequences and explore how their communities can become more resilient. The objective is not simply to prepare students for the world as it is, but to equip them with the knowledge, skills, and agency to help shape the world they will inherit.

Climate education should also aim to develop decision-making, empathy, and communication skills. Some argue that the most important of all is a real sense of efficacy, since people need to feel that what they do is relevant and useful (UNESCO, 2024). This may be explained by its role in fostering empathy. Rather than presenting climate change as a single, detached problem, climate education should encourage students to recognise that its impacts affect people's lives in different ways. Global issues may feel overwhelming, even paralysing, but education can make a critical difference by giving students the tools to see that meaningful changes are happening at international and local levels. Pairing honest discussion of climate risks with solutions-focused learning helps nurture hope and agency rather than despair (Finnegan & d'Abreu, 2024).

Understanding Climate Change Through a Justice Lens

Fairness is another piece that climate education too often leaves out. Impacts and opportunities to respond are rarely spread evenly, with vulnerable communities that have historically contributed the least to climate change disproportionately affected (IPCC, 2023). This varies sharply by community and identity (UNESCO, 2024), meaning the same event can be experienced very differently depending on who you are and where you live. A justice-centred approach pushes students to ask harder questions, each one grounded in something concrete.

1. *Who is most impacted?* During the haze, an office worker can simply turn on an air purifier and stay inside. An outdoor labourer or street vendor cannot. This shows they inhale the same air but suffer substantially greater harm.
2. *Who has the means to take action?* When floodwaters threaten, a well-resourced school can switch to online lessons, while a rural school without TV or internet must close its gates.
3. *Who benefits from a given solution?* A flood-mitigation project that defends a city centre could instead send floodwaters into farmland and villages. What is a "solution" for one community could threaten another.



Questions like these help students see sustainability as more than an environmental concern. At its core, it's about people, communities, and fairness.

Education for a Better Future

The haze over Southeast Asia and the floods in Nepal are reminders that environmental problems never happen in isolation. They cut across the systems that shape our health, education, institutions, and economies. We often believe test scores and employability are the only indicators of success, but crises like these call for a bigger idea. It demands preparing the students to understand complexity,

make responsible decisions, solve real problems, communicate clearly, empathise with others and imagine futures worth working toward. We cannot predict the crises that will unfold in the future, but we can ensure that the children of tomorrow are prepared to face them. Education alone cannot promise a better future; it can only train the people who will build it.

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The Architecture of Agency: Navigating Critical Thought in the AI-Driven Classroom

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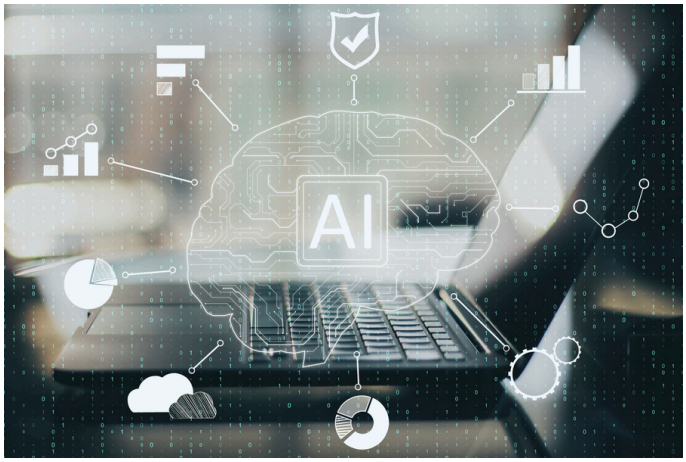
Generative Artificial Intelligence (AI) has become increasingly visible in higher education. In our classroom today, students often use AI tools to work on assignments, develop ideas, improve their writing, or make sense of difficult academic material. For many students, these tools offer a convenient starting point, especially when they are unsure how to begin a task assigned by lecturers.

AI has brought many benefits and opportunities. It can save time, offer suggestions, and provide students with another source of support in their learning. At the same time, its growing presence in the classroom invites us, as educators, to think carefully about what we want our students to gain from a university education. The issue, therefore, is not simply whether students should use AI. A more important question is how they use it. If AI is used thoughtfully, it can complement the learning process, but if it is used as a replacement for thinking, students may complete their academic tasks without fully engaging with the intellectual work behind them. Therefore, three important areas need to be addressed: human agency, critical reflection, and preparation for an AI-integrated workplace.

Preserving Human Agency in the Machine Age

One fundamental requirement for meaningful learning is human agency. In the context of artificial intelligence, human agency refers to the ability to retain control over one's thinking, choices, and decisions rather than allowing AI to perform all the work (Nosta, 2025). Nielsen (2025) further characterises human agency through three related concepts: self-direction, active thinking, and remaining in charge. In an academic context, these concepts involve students making sound decisions about what to learn, critically evaluating the information presented to them, and remaining accountable for the work they produce.

These three aspects matter especially in academic learning, where students are expected to take an active role in developing and expressing their own ideas. When students rely heavily on AI to formulate their main arguments or synthesise complex concepts, they may give up part of this learning process. They may complete the assessments, but they may have fewer opportunities to develop independent thinking. Therefore, our teaching methods should continue to provide students with opportunities to demonstrate their own understanding. Assessments can still incorporate AI, but students should be able to explain their choices, connect ideas to contexts, and show how they reached their conclusions. In other words, AI may assist the students, but it should not replace their voice as the thinker behind the work.



Navigating the Efficiency versus Reflection Trade-off

Generative AI offers remarkable efficiency gains, enabling students to draft text, summarise literature, and generate information within seconds. However, this speed introduces a significant trade-off. Over-reliance on rapid automated outputs can bypass the slow, reflective processes essential for deep critical thinking. Real learning happens through 'productive struggle', which means the effort students make to figure out difficult concepts rather than taking a quick shortcut (Hiebert & Grouws, 2007).

When tasks are automated to maximise speed, learners may become less involved in critically evaluating information. Holmes et al. (2019) emphasise that without intentional space for critical reflection, students may produce polished, highly structured assignments without undergoing the underlying intellectual development required to evaluate accuracy, detect bias, or understand nuance. Ultimately, a better future depends not on how quickly our students can generate answers, but on how deeply they are taught to think.

Preparing for an AI-Integrated Workforce

Rather than prohibiting AI tools, education must focus on building the judgement necessary to navigate an AI-integrated economy. Modern industries do not simply value speed; they require professionals who can take initiative, make independent decisions, provide human direction, and critically evaluate AI-generated outputs (Ono, 2026). Therefore, education should prepare students not merely to use AI efficiently but to critically evaluate its outputs and remain responsible for the decisions and work they produce.

Future workplaces will evaluate graduates not merely on how quickly they can generate content but on their ability to rigorously check AI-generated outputs, refine strategies, and use human judgement when AI falls short. By teaching students to treat AI as a collaborative counterpart subject to human verification, educators equip them with hybrid skills essential for future professional environments. Ultimately, modern education should not compete with technology but cultivate human agency and critical reasoning alongside it.

To give students greater ownership of their learning, universities should prioritise human thinking over instant AI-generated answers. Technology should enhance student talent rather than replace it, ensuring learners stay firmly in control of their own writing ideas. Preparing students for an AI-integrated workforce is not about competing with machine speed but about fostering the critical thinking, ethical grounding, and strategic thinking required to guide technology toward a better future.



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Transforming Teaching and Learning for a Sustainable and Equitable Future

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Education plays a vital role in individual and social development, yet twenty-first-century challenges require new approaches to teaching and learning. Climate change, technological advances, socioeconomic inequalities, and evolving workforce demands highlight the need for education that is sustainable, equitable, inclusive, and responsive. Higher education must therefore align curriculum and pedagogy with sustainability-oriented learning while preparing students not only for employment but also to think critically, make informed decisions, and contribute responsibly to society (Vargas-Merino et al., 2024).

1. Sustainability, Equity, and Inclusive Learning

Schools should integrate sustainability into educational thinking and practice, rather than treating it solely as an environmental topic. This entails understanding the connections between environmental, social, and economic well-being and recognising how individual and collective decisions affect communities, resources, and future generations. Classroom discussions, interdisciplinary projects, community engagement, and problem-based learning can help learners connect sustainability to real-life responsibilities. Participatory and transdisciplinary approaches also support inclusive, transformative education for sustainable development (Fernando & Tajan, 2024).

At the same time, sustainable education must be equitable. Although access to education has expanded, learners differ in socioeconomic background, ability, experience, resources, and digital access. Providing everyone with the same support may therefore fail to address existing inequalities. An equitable approach recognises these differences and provides appropriate learning opportunities and support, enabling all learners to participate meaningfully and succeed.

2. Technology and the Changing Role of Educators

Digital platforms, artificial intelligence, open educational resources, and flexible learning environments have expanded opportunities to access knowledge, personalise learning, and improve teaching and learning. Artificial intelligence, in particular, is being applied in areas such as adaptive learning, personalised tutoring, assessment, prediction, and educational management. At the same time, research identifies key challenges in its adoption and implementation (Wang et al., 2024). Educational technology should therefore be implemented carefully and inclusively to support meaningful learning rather than create additional barriers.



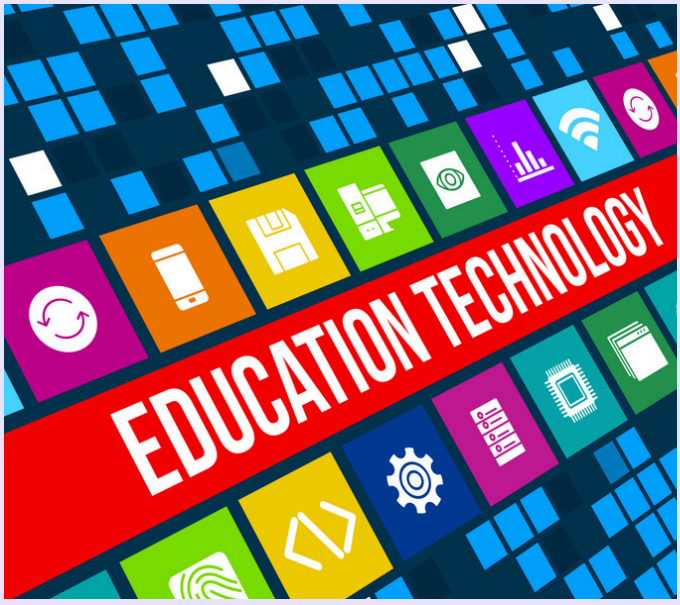
These developments also change educators' roles. Teachers are increasingly expected to facilitate learning, encourage inquiry, guide students in evaluating information, and create environments that foster questioning, exploration, and collaboration. They also play an important role in developing empathy, ethical awareness, resilience, creativity, and critical thinking. As artificial intelligence becomes more prominent, educators require appropriate preparation and professional development to use emerging technologies effectively and responsibly (Aljemely, 2024).

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3. Future-Oriented Curriculum and Authentic Assessment

Curriculum and assessment must evolve alongside these changes. A future-oriented curriculum should connect disciplinary knowledge to authentic problems and real-world contexts, giving students opportunities to apply knowledge rather than simply reproduce information for examinations. Learning should develop competencies such as problem-solving, communication, creativity, collaboration, critical thinking, and reflection.

Assessment should likewise become an integral part of learning rather than functioning only as a final measure of achievement. Authentic tasks can encourage students to apply knowledge, reflect on their learning, and take greater responsibility for their development. Evidence suggests that authentic assessment can support critical thinking, problem-solving, collaboration, and other twenty-first-century competencies by engaging students in meaningful real-world tasks (Vlachopoulos & Makri, 2024).



Conclusion

Transforming teaching and learning for a sustainable and equitable future requires integrating sustainability and equity, using technology responsibly, strengthening educators' roles, and adopting a future-oriented curriculum and authentic assessment. Success should extend beyond academic achievement and employability to learners' ability to think critically, adapt to change, make responsible decisions, and contribute meaningfully to society. Ultimately, education should empower learners to help build a more sustainable, equitable, and inclusive future.

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Future-Proofing Society Through Education

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Introduction

Education is more than knowledge transmission; it transforms societies, drives innovation, and nurtures human dignity. As nations strive to achieve the Sustainable Development Goals (SDGs), education emerges as both a standalone priority and a catalyst for progress across all dimensions of development (UNESCO, 2026). A future built on education embeds equity, sustainability, and resilience in society's foundations.

Education as a Foundation for Social Equity

Education's promise lies in its ability to dismantle systemic inequalities. Access to quality education reduces disparities linked to gender, socioeconomic status, and geography. Inclusive education policies ensure that marginalized groups, including children with disabilities and rural communities, are not left behind (Henry & Kauppi, 2025). By embedding principles of fairness and justice into curricula, education becomes a tool for social transformation, empowering individuals to challenge discrimination and contribute meaningfully to civic life.



Education also plays a critical role in promoting social cohesion and democratic participation. When learners encounter diverse perspectives and inclusive practices, they are better equipped to engage in civic dialogue and advocate for equity.

UNESCO (2026) emphasizes that education fosters respect for human rights and strengthens communities by cultivating empathy and shared responsibility. In this way, education not only addresses immediate inequalities but also builds the foundation for a more just and resilient society.

Education and Economic Empowerment

Education is a proven driver of economic growth. Research consistently shows that each additional year of schooling increases individual earnings by nearly 10 percent, while simultaneously strengthening national productivity (Benveniste, 2025). In Malaysia, aligning education with labour market needs is critical to preparing youth for the challenges of globalization and technological disruption. Partnerships between educational institutions and the private sector can bridge skills gaps, ensuring that graduates are equipped for emerging industries such as digital technology, renewable energy, and sustainable agriculture (UNESCO, 2026).

Beyond economic growth, education also fosters innovation and entrepreneurship. By equipping learners with critical thinking and problem-solving skills, education enables them to create new opportunities and contribute to sustainable industries. UNESCO (2026) notes that education systems that integrate digital literacy and sustainability principles can empower individuals to participate in the green economy. This not only boosts employability but also aligns economic empowerment with long-term social and environmental goals.

Lifelong Learning and Global Challenges

The future demands adaptability, and lifelong learning equips individuals to reskill and upskill as circumstances evolve, from technological innovation to climate change.

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UNESCO emphasizes that education builds resilience against crises, whether environmental, economic, or social (UNESCO, 2026). Embedding sustainability into teaching and learning prepares future generations to address ecological challenges and foster peace.

Lifelong learning also strengthens social cohesion by encouraging continuous engagement with knowledge and civic responsibility. Henry and Kauppi (2025) argue that education must extend beyond formal schooling to include community-based initiatives, vocational training, and digital platforms that promote inclusivity. These approaches help individuals remain active contributors to society, navigate global challenges, and uphold values of justice and sustainability.

Challenges and Strategic Directions

Despite progress, barriers remain. Globally, millions of children remain out of school, mostly in developing regions (UNESCO, 2026). In Malaysia, rural-urban divides, digital inequities, and socioeconomic disparities continue to hinder equitable access. Addressing these challenges requires:

- **Inclusive education policies** that prioritize vulnerable groups (Henry & Kauppi, 2025).
- **Investment in teacher training** to enhance quality and pedagogy (Benveniste, 2025).
- **Integrate digital literacy** to prepare learners for the future of work (UNESCO, 2026).
- **Public-private partnerships** to align education with industry needs (Benveniste, 2025).

Conclusion

Education for a better future is not an abstract vision but an urgent necessity. By embedding equity, sustainability, and lifelong learning into education systems, societies can ensure that no learner is excluded and that future generations inherit a world built on knowledge, justice, and resilience. The pathway to a better future begins in classrooms, but its impact extends far beyond into communities, economies, and the global stage.

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The First Error Message: Why Students Should Not Be Afraid to Make Mistakes

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It is a familiar scene in a university computer laboratory. A lecturer demonstrates a short program, the class follows along, and everyone clicks 'Run'. A few seconds later, a student raises a hand and asks, “Sir, why is mine showing red?” The message may look alarming, especially when everyone else seems to be moving ahead. Yet that first error message is not proof of failure. It is often where real learning begins.

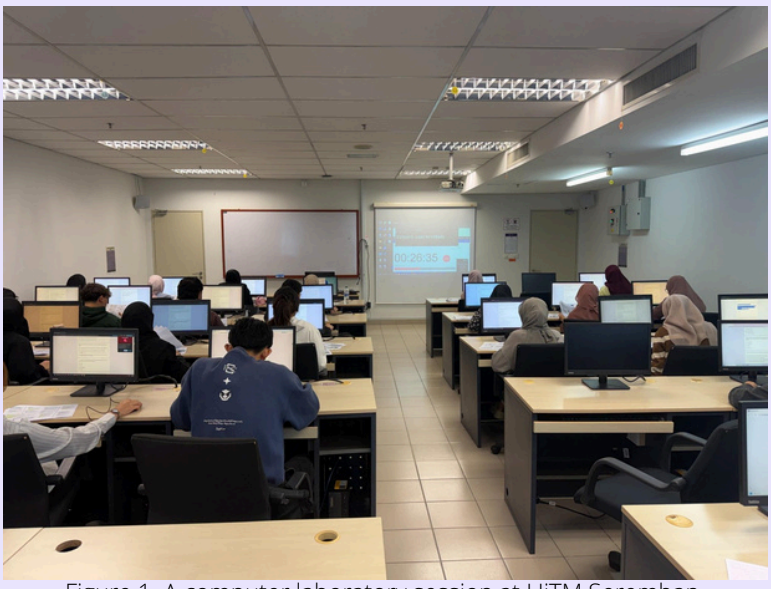


Figure 1. A computer laboratory session at UiTM Seremban, where problem-solving often begins with a first attempt.

Learning from an Error

In computer science, mistakes are part of the work. A missing semicolon, an incorrect condition or a variable with the wrong value can stop a program from running. The screen points to the problem, and the student reads the message, checks the code, tests an idea and tries again. We call this debugging, but it teaches more than programming. It builds patience, attention to detail, and a willingness to revise our thinking. Research on learning from errors similarly finds that an incorrect attempt can help when it is followed by corrective feedback (Metcalfe, 2017).

The same lesson applies across university life. Students write a first draft, receive feedback and improve it. They solve a calculation, discover an assumption was wrong, and start again. They rehearse a presentation, forget a point and become better prepared for the next attempt. Education has never been a straight journey from question to perfect answer. It grows through attempts that gradually become clearer and stronger.

Why Students Hold Back

Still, many students fear being wrong. In a lecture hall, they may stay quiet because they do not want to give the wrong answer. During a tutorial, they may wait for a confident friend to speak first. A student may hesitate to post a basic question in the class WhatsApp group or upload an unfinished draft to Google Drive. Someone new to coding may copy a friend’s working program instead of asking why their own version failed. The immediate problem disappears, but so does an important learning opportunity.

A better learning culture does not celebrate careless work or pretend every answer is correct. It treats a reasonable mistake as useful information. What did we misunderstand? Which assumption failed? What can we change before the next attempt? These questions move students from embarrassment to curiosity. They also help lecturers identify where an explanation, example or exercise needs improvement. Feedback is most useful when it helps learners see what to improve and how to move forward (Hattie & Timperley, 2007).

Using AI to Think More Clearly

This matters even more now that generative artificial intelligence can produce polished answers within seconds. AI can explain a concept, suggest code, organise notes and improve a paragraph. Used thoughtfully, it can be a valuable learning companion. Used carelessly, it can remove the struggle that helps understanding grow. A student may submit an impressive answer without knowing why it works. UNESCO guidance likewise calls for educational uses of AI that protect human agency (Miao & Holmes, 2023).

The difference often lies in the question. Instead of asking AI to write the solution, a student can ask, "What does this error mean?" "Give me a hint without revealing the full answer" or "Can you check my reasoning and show me where it goes wrong?" These prompts keep the student involved. AI becomes part of the debugging process rather than a substitute for thinking.



Figure 2. Debugging turns mistakes into a continuous cycle of checking, improving and trying again.

Making Room to Try Again

Students will only take these risks when the classroom feels safe enough. A lecturer's response can make a lasting difference. "Let's look at why that happened" opens a door; "You should already know this" closes it. Peer behaviour matters too. When classmates listen respectfully and share their own difficulties, mistakes become less isolating. The classroom becomes a place where people learn with one another, not a stage where everyone must appear perfect.

This does not mean lowering standards. Constructive feedback often raises them. Students who understand what went wrong can correct it, explain it and avoid repeating it. They become less dependent on memorised answers and better able to handle unfamiliar problems. That ability is especially important in computing, where technology changes quickly and yesterday's solution may not fit tomorrow's challenge. Research on feedback supports this emphasis on information students can use to improve their work (Hattie & Timperley, 2007).

Skills That Last Beyond University

Future workplaces will not be error-free. Systems will fail, data will be incomplete, user requirements will change, and project plans will need revision. Employers will value graduates who can respond calmly, ask useful questions and improve a weak first attempt. Technical knowledge matters, but so do resilience, judgement and the courage to admit, "This did not work. Let me find out why."

That is part of education for a better future. We are not preparing students for a world in which they will always know the answer. We are preparing them to meet uncertainty without giving up. A student who sees a red error message may feel frustrated, especially when an assignment is due at 11.58 p.m. But if that student learns to pause, read, test and try again, the lesson will last much longer than the program itself.

A mistake is not a label. It is feedback. The first error message does not tell students that they do not belong in computer science. It invites them to look more closely, think more carefully, and take the next step. Sometimes, that is exactly where confidence begins.

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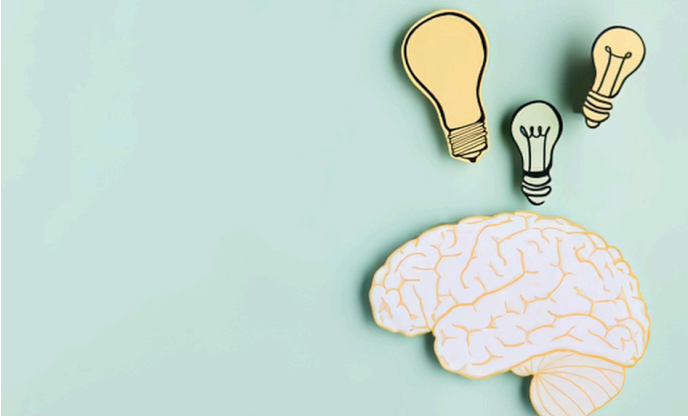
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Thinking Beyond the Prompt: Critical Thinking for an AI-Driven Future

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AI Is Changing the Future - But Thinking Still Matters

Artificial intelligence (AI) is rapidly becoming part of how we learn, work, communicate and solve problems. Within seconds, generative AI can draft text, summarise information, generate ideas, analyse data, and help with routine tasks. For students and fresh graduates, the ability to use AI is therefore becoming an increasingly valuable form of digital literacy. Yet education for a better future cannot merely mean teaching students how to use AI tools available online. What should be emphasized is that it must also prepare them to decide when to use AI, how to question its output, and whether the information produced is accurate, relevant, ethical and appropriate, which is a common struggle in the classroom nowadays.

This is where critical thinking becomes indispensable. Although AI can produce a convincing answer, it is not necessarily correct or well-reasoned. Users still need to examine assumptions, evaluate evidence, recognise limitations, and make informed judgements. UNESCO (2024) similarly places human-centred judgement, ethics, and critical evaluation at the heart of students' competencies for generative AI. In other words, AI literacy and critical thinking should not be treated as competing skills; they need to develop together.

What Will Employers Expect from Graduates?

The changing workplace strengthens this argument. The World Economic Forum's Future of Jobs Report 2025 identifies analytical thinking as the most sought-after core skill among employers, while AI and big data are among the fastest-growing skills (World Economic Forum, 2025). Not surprisingly, employers have sought analytical thinking for years. The combination of AI and analytical thinking is significant. Graduates should shift their perspective from viewing themselves as individuals whom employers need merely to operate new technologies to recognizing that employers need them to interpret information, solve unfamiliar problems, make sound decisions, communicate their reasoning, and adapt to changing circumstances.

For fresh graduates, critical thinking can therefore become a form of professional readiness. In the workplace, employees may be expected to compare alternatives, respond to unexpected problems, justify recommendations, and evaluate information before acting on it. Undergraduates often overlook these vital aspects, as many rely too heavily on AI to do the thinking for them. Despite the support AI provides in these processes, they should realise that the final judgement remains theirs. This is where many graduates fail to grasp that working faster with AI does not mean the work is better. When a graduate questions, verifies, improves, and contextualises the response, it shows they use AI as a tool. However, if they don't think, it shows they are surrendering judgement to it.

AI Becomes More Valuable When Humans Think Critically

Educators used to debate whether students should be allowed to use AI. The real educational challenge now, however, is how they should think

while using it, because preventing them from using AI will deprive them of opportunities to develop the AI literacy they will need in their future workplace. Critical thinkers can ask better questions, refine prompts, compare AI-generated answers with other sources, identify missing perspectives, and recognise when an answer requires verification. Research on large language models in education has highlighted both their potential and their risks, including inaccurate information, bias and overreliance (Kasneci et al., 2023). These limitations strengthen the need for human judgement.

A useful principle for students is simple: ask, examine, verify and improve. They should know they can ask AI for assistance, examine its reasoning and evidence, verify key claims against credible sources, and improve the output using their own disciplinary knowledge and judgement. This encourages a shift from passive consumption to active intellectual engagement with AI.

The Role of Educational Institutions



Educational institutions at every level play a vital role in building this habit of mind. Since many school kids are exposed to AI at home, schools can encourage questioning, evidence-based reasoning, and responsible technology use from an early stage. Higher education institutions carry greater responsibility because they prepare students for professional practice. Therefore, universities should move beyond policies that emphasise only whether AI is permitted. They also need to design learning activities and assessments that make students' thinking visible.

Instead of asking only about the ‘what’, universities can achieve this through problem-based tasks, discussions, case analyses, reflective writing, and assessments that require students to explain how and why they reached a conclusion. One recommended activity is reflective writing. Reflective writing is particularly useful because it encourages learners to revisit experiences, examine decisions, consider alternatives and assess what they have learned. Nevertheless, to reach a critical-thinking level, educators must guide this writing effectively. Merely recalling experiences without properly evaluating the situations encountered may not help students enhance their critical thinking skills. Such guidance becomes even more relevant in the AI era, when producing text is easy because students use prompts, but demonstrating genuine thinking is increasingly important.

Educating for a Better Future

Making students compete with AI at tasks machines can perform efficiently should not be the objective of education for a better future. Ideally, AI should strengthen the distinctly human capacities needed to use technology wisely: curiosity, judgement, reflection, ethical awareness, creativity, and critical thinking. In general, though, AI can extend what learners and employees can do, but its value depends largely on the quality of the human thinking behind its use.

AI literacy alone is not enough for future graduates. Their ability to question AI, collaborate with it, challenge it, and know when not to rely on it is far more important. Higher education needs to cultivate these abilities so AI does not weaken human thinking. When used critically, it can become a powerful partner in learning and work, while human judgement remains firmly in the driver's seat.

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Beyond Grades and AI: Developing Authentic English Skills for Future Employability

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In Malaysia, substantial alterations have transformed English language learning, leading to expectations that learners actively expand and employ the language. These changes have led to expectations that learners actively expand and use English. Back then, English learning was often associated with examinations, where achieving excellent results through reading and writing tasks was the primary focus. However, the current education system is moving towards a more practical approach that encourages learners to use English instantly. The Common European Framework of Reference (CEFR) is an undertaking to facilitate this transformation by emphasising different aspects of language proficiency, including communication skills (Council of Europe, 2018). Simultaneously, the rapid development of Artificial Intelligence (AI) has introduced new opportunities, but overreliance on these tools may impair learners' capacity to communicate autonomously. Consequently, English instruction must balance technological integration with practical language application. This article discusses how English education in Malaysia can transcend examination-oriented learning by promoting authentic language use, responsible AI integration, and stronger preparation for future employability.



Bringing English Authenticity Out of Examination

It has been a while since important examinations like UPSR and PT3 were abolished. English learning no longer depends on examinations, even though schools still run small tests. CEFR, or the Common European Framework of Reference, is used to measure language ability among learners from primary to tertiary education, defining six proficiency levels, from A1 (beginner) to C6 (near-native).

The implementation of CEFR suggests that speaking proficiency is as crucial as reading and writing (Council of Europe, 2001, p. 5). Not only that, educators are guided by the guidelines provided by CEFR to train learners in English language skills that cover the ability to use English not only in the classroom but also in the real world (Wok Zaki & Darmi, 2021). This is because the implementation of CEFR in terms of practice and topics covered ranges from basic to daily life communication. Language learning is encouraged to be collaborative and varied in activities; thus, learners will adapt to be proactive and responsive when participating in class (Ahmad Sukri et al., 2025). If CEFR is implemented correctly and actively, classroom learning becomes a fundamental platform to prepare learners to learn English authentically rather than relying solely on theories.

AI in English Learning

Artificial Intelligence (AI) is now considered a pivotal part of learning in English classrooms. The use of AI, such as ChatGPT, Gemini, and Claude, started as additional material for teaching and learning and has grown to be an important element embedded in English language learning. AI should not be the main tool, but its existence is undeniable. Educators have complained about the massive overuse of AI

in academic contexts, ranging from as basic as brainstorming ideas to completing assessments. Such a situation undoubtedly triggers an overreliance on AI, resulting in well-crafted written products but a lack of ability to produce fluent spoken and spontaneous outcomes. This situation has led to a unanimous agreement that we must regulate AI use and provide proper training for its implementation, ensuring that the assistant tool is taught effectively. The saying “if you can't beat them, join them” describes the current English learning situation in Malaysia. One way to cope with the advancement of AI is to incorporate its use in learning while maintaining control. Training or courses related to English learning that highlight academic credibility should be introduced so that learners understand that using AI is allowed but within a certain range, as long as the authenticity and credibility of the products are prioritised (Felice, March 12, 2026). For example, learners can use ChatGPT to generate ideas at the beginning of the writing process, provided they review these ideas and understand the framework they use to develop the content. This approach will encourage learners to have a sense of control over the content, learn pronunciation, grammar, and vocabulary, and receive real-time feedback (Zhao, 2025).

From English in Classrooms to Employability

With the abolition of examinations and the implementation of AI in education, the idea that learning English is no longer needed begins to be indoctrinated among Malaysian learners. To some extent, learners start to believe that English learning does not require teachers or formal classes, as AI or Internet platforms can take the role. This propaganda has begun to show its effects, as evidenced by a deterioration in interest, attendance, and academic results. The situation not only negatively impacts English learners' proficiency in classes but also jeopardises their overall communication skills. The reliance on AI has resulted in learners having limited mastery of English, and their application of English is minimal. It significantly affects the employability of school leavers and graduates. This situation has raised concerns not only among academics but also among employers in Malaysia, as English is prominent as the second language and is treated as a lingua franca in the economy and international business apart from Bahasa Malaysia. To prepare students for employment, the Malaysian Education Ministry is now gradually amending and improving the policies. Educational institutions have also taken steps to embed workplace English courses, professional communication skills training, and related and systematic evaluations (Mustafa, July 11, 2018). It is critical to revamp undergraduate curricula to assess, balance, and strengthen English language skills, communication skills, confidence, and professional presentation skills among undergraduates (Nesaratnam et al., 2020). This effort is not just for the sake of academic achievement, but Zawawi et al. (2025) agree it will be an asset and investment for future employability, especially in the demanding labour market.

Conclusion

Future English proficiency among learners in Malaysia depends on the changes and improvements made to English language and communication skills offered in educational institutions, embedding AI application skills and highlighting authentic English use over examination-oriented English. The Malaysian Education Ministry and academics have tried all possible ways and are planning to ensure the success of improving the achievement of English learners. However, all these depend on learners taking English language learning seriously.

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Educating Responsible Graduates: The Role of Ethics and Values in Higher Education

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INTRODUCTION

Academic success, professional knowledge, and employability are often linked to higher education. Educating students for the future is more than providing technical content and job skills. Universities also play an important role in developing graduates with a strong understanding of ethics, integrity, responsibility, and accountability. A successful graduate is not just someone who knows what to do but someone who understands what should be done and why. In an evolving world shaped by technological advancements, AI globalisation, and a more complex working environment, the ability to make ethical decisions is integral to a responsible professional's role. Hence, future education should encompass responsible decision-making, ethical behaviour, and social responsibility.

Beyond Knowledge: Why Ethics Matter?

Across higher education, institutions face a critical challenge: preparing graduates who are not just technically skilled but also morally grounded and equipped to navigate complex ethical challenges in the workplace and society (Haron et al., 2023; Stekelenburg et al., 2023). Students may vary in their approach to various techniques. There will be times when a problem arises for which the right answer is unclear at the time. These are situations that illustrate the importance of ethical education. As recently shown, ethical agency is essential to student development, not just rules and punishment. Brickhill et al. (2024) found that an educative approach to academic integrity enables students to exercise agency and see integrity as part of their emerging academic identity. They recognised trust, honesty, fairness, respect, responsibility, and courage as key pillars of academic integrity. This shows that ethics should not be taught as a set of rules for students to follow. Instead, students should learn the principles behind the rules and apply them in decision-making.



Beyond Rules: Building Ethics and Values

Raising responsible graduates demands that higher education institutions shift from a system that focuses primarily on rules, regulations, and punishments. Policies are important for safeguarding standards in school, but a sustained commitment to integrity is stronger when students see the value of ethical actions and slowly build this attitude into their personal values and identity (Hagège, 2023; Wan Khairuldin et al., 2025). Brickhill et al. (2024) noted that trust, honesty, fairness, respect, responsibility, and courage are the fundamental values of academic integrity that offer a solid foundation for building ethical learning communities. These values also relate to Islamic values grounded in *amanah, sidq, mas'uliyyah,* and *hisbah* (Wan Khairuldin et al., 2025). In addition, Hagège (2023) noted that students' critical thinking about rules and their own choices is important. Furthermore, they should not do what they are told out of fear of repercussions. Instead, they should ask themselves: Is this action right? Whom would it impact? What are the repercussions? This reflective exercise helps

students become more personally responsible and build confidence in making ethical decisions, even when the situation is unclear.

Towards a culture of responsibility

Creating responsible graduates requires a whole-of-institution approach. No one course, one lecturer, or one unit can be held accountable for ethics. It should permeate teaching and assessment, student activities, university policies, and staff-student interactions. There are several actions that can reinforce this culture:

1. Apply academic integrity policies not only to violations but also to educate students on why integrity matters.
2. Link ethics to the curriculum by making opportunities for students to bring up ethical issues in the areas of their studies.
3. Give students opportunities to express their thinking, consider consequences, and learn from ethical dilemmas.
4. Enhance experiential learning through internships, community work and authentic case studies.
5. Engage students in discussions on academic integrity and responsible learning, and keep policies and approaches relevant to today's student context.

In this way, higher education can transcend producing graduates who know what to do and instead produce graduates with a values-based sense of purpose and the courage to act on it. Education for a better future, therefore, starts not just with what students know but also with whom they become and how they use what they know.

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Learner Engagement in Online Webinars

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Online webinars have become increasingly critical as the shift towards online and blended learning accelerates, especially in higher education. Engagement is essential not only for retention but also for meaningful learning experiences. Webinars offer flexibility in teaching and learning but also pose challenges because they lack physical presence and can be distracting (Ramos & Soliven, 2020). This article shares engagement strategies used in an online webinar for a reading course and assesses their impact on undergraduate students' involvement in learning.



Importance of learner engagement in webinars

Learner engagement is commonly defined as a multidimensional construct involving behavioural, cognitive, and emotional aspects. Studies have shown that content relevance, interactive tools, multimedia use, and the presenter's delivery style drive engagement in webinars. Conversely, barriers such as technical issues, session length, and low interactivity reduce engagement levels (Pedroso, 2021).

Learner engagement has become a central focus in online education, particularly in webinars, which offer a unique blend of synchronous interaction and digital flexibility. Engagement in online learning environments generally refers to the attention, curiosity, and interest students show during a learning experience (Nagaraju et al., 2021). Webinars, while efficient and accessible, struggle to sustain learner engagement because of physical separation and potential distractions.

What constitutes learner engagement in online webinars?

Effective engagement strategies in webinars often include multimedia, interactive elements such as polls and quizzes, and active learning components like discussions or Q&A sessions. These strategies help reduce cognitive overload and foster learner motivation by making content more interactive and relatable. For instance, research indicates that integrating multimedia content enhances attention span and knowledge retention, especially when paired with real-time feedback (Zhang et al., 2006).

Instructors also play a critical role in shaping learners' engagement in webinars. Instructor presence, delivery style, and the use of chat or emotive cues have been found to significantly impact learners' perceived connection and participation levels. (Ramos & Soliven, 2020). Social presence theory suggests that when learners feel acknowledged and included, their participation and satisfaction increase (Al-Naabi, 2023). Despite these strategies, barriers such as technical issues, poor interactivity, and content irrelevance continue to hinder engagement. Thus, effective engagement strategies are necessary to meet learners' needs and support webinar goals.

An exploratory study of learner engagement in an online webinar

This article presents an exploratory quantitative survey of students enrolled in an English language course at a public university, Universiti Teknologi MARA, Seremban campus. The researchers conducted online webinars in the March 2026 semester to supplement the course as part of a

collaborative teaching initiative. The study distributed a Google Form survey to gather responses from 113 participants on their engagement experiences and perceptions of webinar strategies.

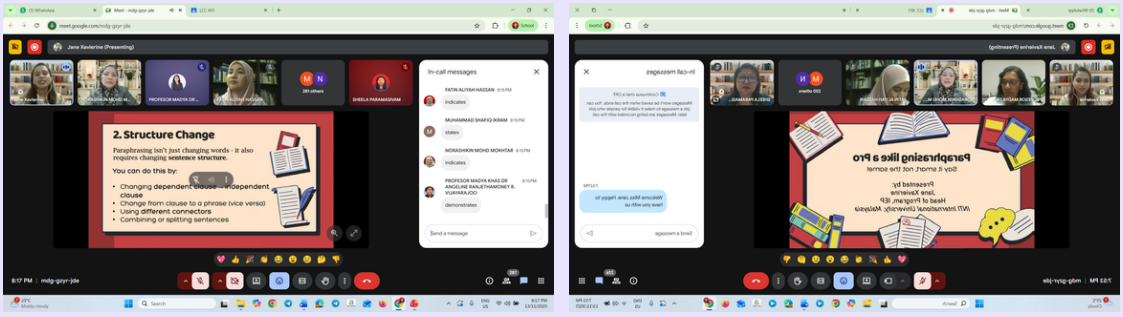
Survey findings indicated that 54.9% of students stayed engaged throughout the entire online webinar session conducted via Google Meet, while 28.3% said they were engaged for most of the time. Multimedia content was the most impactful strategy, preferred by 60.2% of participants. Other commonly used tools included Q&A sessions (26.5%) and chat features (12.4%), which sustained participants' interest in the webinar. A significant majority (64.3%) reported using these strategies consistently throughout the session.

When asked whether these strategies influenced their decision to stay for the entire webinar, 54% said they did, and 43.4% said they somewhat helped retain their interest. Students rated the engagement strategies highly, with over 80% giving scores of 4 or 5 out of 5 on a Likert scale. Students were pleased with the speakers' engaging presentation style and the use of interactive multimedia. Barriers to engagement included technical issues (53.2%), external distractions (35.8%), and long, unstructured sessions (29.4%).

This study found that effective webinar engagement relies on speakers' consistent use of multimedia, interactive tools, and engaging presentation styles. These were considered the most engaging strategies that attracted students to 'stay tuned' in the webinar. Most students reported being engaged for most or all of the webinar sessions and showed strong satisfaction with the strategies employed. These results underscore the need for thoughtful webinar design that incorporates these elements.

Insights for future implementation of online webinars

As such, webinars are seen as an engaging platform and a useful strategy for delivering content to students because they are interactive and foster learners' engagement in teaching and learning. Students look forward to interactive engagement with webinar speakers, such as games, Q&A sessions, and multimedia tools. Institutions of higher learning should invest in training faculty to use interactive technologies and follow best practices in webinar delivery. Technical infrastructure must be reliable to prevent disengagement caused by system failures. Future research could explore engagement strategies across disciplines or compare webinar engagement in synchronous versus asynchronous formats.



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Preparing the Next Generation for an AI-Driven World

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Introduction

Education has been the foundation of societal development for every individual. Nonetheless, its role is changing in the fast-moving world of technology, automation, and artificial intelligence (AI) (Liu & Zhong, 2024). Therefore, our education system must equip students to thrive in the modern world, seize opportunities, and overcome obstacles that are not yet apparent.

Critical thinking, ethical awareness, and AI literacy are becoming increasingly important in every school regardless of the students' age. These skills help students understand technology, assess data, and make informed choices (Walter, 2024; Yim, 2024). The question is how to ensure that technological advancement does not replace human potential but enhances it by using digital skills in education.

Figure 1
Introduction to AI as future-ready skills



AI: Transforming the Way We Learn

AI creates new opportunities for teaching and learning by helping educators prepare learning materials and provide explanations that motivate students. These applications offer more flexible and customized educational experiences. However, access to AI does not necessarily lead to substantial learning, as AI-generated information may be inaccurate, and overreliance on automated responses may reduce opportunities for independent reasoning.

Walter (2024) stresses the need to integrate AI literacy with critical thinking and the ability to engage effectively with standard AI systems. Students must learn not just how to use AI but also how to question its responses, verify information, and identify its limitations. The point is not to replace human thought with technology. Rather, AI should become a learning companion that encourages curiosity, exploration, and deeper understanding.

Building Skills for the Future

Students need more than academic credentials to succeed in the future. Digital literacy teaches students how to use technology correctly. Data literacy empowers students to understand information and make evidence-based decisions. Critical thinking helps them analyze ideas, problems, and solutions. Creativity, communication, collaboration, and adaptability are equally important. These talents help people work with one another and handle new situations.

According to Yim (2024), AI literacy is connected to digital literacy, data literacy, computational thinking, and AI ethics. This suggests that future education will combine technological literacy with broader intellectual and social capabilities. Rather than focusing exclusively on memorizing information, classrooms should give students opportunities to investigate real-world problems, develop solutions, and explain their reasoning.

Lifelong Learning and Responsible Innovation

The workplace is changing, and careers may require new skills. Education is not just about graduation; it is a lifelong journey. People meet changing needs through professional training,

online courses, and self-study. Schools and colleges can help by providing flexible learning opportunities at various life stages.

This technological potential must be matched by an ethical commitment. Students should value privacy, fairness, academic integrity, and responsible AI use. Yusuf et al. (2024) conducted comprehensive research on AI education and identified ethical concerns and professional growth as key topics. This emphasizes the need to teach students to evaluate the consequences of new technology for society and individuals.

Education for a better future means preparing people to navigate change with knowledge, confidence, and responsibility. AI and digital technology offer valuable opportunities, but their benefits depend on how effectively they are integrated into meaningful learning.

Conclusion: Investing in the Future

A future-ready education system must combine academic knowledge, digital literacy, critical thinking, creativity and ethical awareness. It must also ensure that learners from all backgrounds have opportunities to develop these capabilities. Ultimately, technology alone cannot create a better future. People do. By empowering learners to think independently, embrace lifelong learning, and use innovation responsibly, education can help build a more inclusive, adaptable society prepared for the challenges ahead.

Figure 2
The future begins with what we teach today and with the opportunities we give every learner to shape tomorrow.



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Education for a Better Future and a Better Future for Education – A delicate balance

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The term education in its broadest sense is often categorized into formal and informal education. Formal education involves designing and delivering curricular content, instructional practices, and evaluative processes that collectively develop learners' knowledge, skills, and competencies. (Pappa et al., 2023). This view foregrounds (formal) education as an organized, ongoing enterprise that integrates content with pedagogy, assessment, and professional development.

Attaining formal education to propel oneself for a better future, especially career growth, is a common move. Advancing one's career by obtaining better qualifications and credentials has been made easier over the years – where once an individual is required to attend daily classes in the flesh, the existence of online and hybrid classes has made attaining education much easier. For individuals in full-time employment, universities now offer qualifications through the 'omnibus' concept (Mishra, 2017, as cited in DeVries, 2019), more commonly known as the Open University concept. Global online learning platforms such as FutureLearn Coursera, Udemy and Khan Academy are also highly popular.

While formal education clearly plays an important role in shaping individuals and giving them a better future, one aspect that warrants attention is the future of education itself. This is because, to shape a nation's individuals into citizens who contribute to the nation's development, the education offered must be highly relevant and cater to the majority of the workforce.



However, the explosion of machine learning, such as Artificial Intelligence (AI) and the Internet of Things (IoT), has shaped a very different world from what it looked like just 10 years ago. Like most fields such as media, health, finance and even agriculture, the education sector is not immune to these changes.

Many challenges threaten the relevance and sustainability of today's education sector. According to the Department of Statistics, Malaysia (DOSM, 2026), the younger generation making up the bulk of the workforce today, which understandably is the generation which has more time to actually *experience* a future, are those aged between 25 and 34, with the 25 to 29 age group consistently making up the largest individual segment of the active workforce. DOSM (2026) reports that the national median age is 31.7 years, reflecting a highly productive, young-to-prime-age workforce even as the country gradually transitions toward an older population structure.

The individuals within the age bracket stated above are also known as Generation Z or Gen Z - a generation who are true digital nomads, not having lived or recognize a world without mobile handphones and high-speed internet. Previous findings also indicate that Gen Z has unique attributes that stem from this digital environment. Their beliefs and preferences for both study methods and work ethics differ greatly from those of the previous generations, notably the Baby Boomers and Gen X.

Thus, keeping education relevant in today's fast-changing landscape requires those developing better educational frameworks to account for the complex personalities of Gen Z, who make up the bulk of the workforce. While AI has received significant attention in discussions of changes in education and other fields, human resource development requires a delicate synthesis of competencies, digital proficiency, and humanistic soft skills. Ramamonjisoa (2024) states that while technological knowledge and skills are often seen as crucial, foundational 21st-century skills such as critical thinking, problem solving, collaboration, communication, creativity, adaptability, and lifelong learning are repeatedly foregrounded as essential underpinning for AI-enabled work and learning environments, and even though AI handles more technical and routine tasks, human skills remain a great asset.

As previously mentioned, the studying and work ethics of Gen Z differ from those of Baby Boomers and Gen X. Gen Z individuals tend to approach learning with a flexible, self-directed mindset, whereas older generations may prioritize credentialing and traditional curricula. In terms of work ethic, Gen Z personalities appear to be more oriented toward flexible, less hierarchical work experiences than Baby Boomers and Gen X, who often prioritize stability and loyalty (Dina & Aharon, 2011). Gen Z individuals also prefer to work independently, off-site, and without direct management supervision (Trevino et al., 2000).

Therefore, taking these differing study and work ethics into account, the delicate balance needed to better future curricula is one that equally emphasizes technological knowledge and the unique humanistic values and traits of Gen Z. For example, the new generation must be taught to use AI responsibly and to engage in honest protection and interpretation of data representations. Meaningful and polite conversation and a certain level of respect for authority are still tantamount – and this is proving to be challenging as mobile education takes over the educational scene and face-to-face interaction is no longer considered highly necessary. The new generation must also be taught not to over-rely on technology and AI, as research has proven this over-reliance leads to cognitive decline, which in turn impedes creativity and critical thinking. Reducing over-reliance on AI is also crucial but challenging, as this generation is prone to seeking immediate knowledge, where authenticity and truth may be overlooked. Preference for entrepreneurship and gig economies over employment with fixed salaries is also proving to pose a challenge to educational settings that fail to emphasize on self-directed and continuous learning.

In response to these changing educational needs, Universiti Teknologi MARA has integrated humanistic values as a vital complementary factor alongside technological knowledge by introducing the A.D.A.B model (Centre of Innovative Delivery and Learning Development [CIDL UiTM], 2026) in the curricula in 2021, a model that adapts traditional teaching approaches to promote holistic character development and ethical values by fostering connections with knowledge, others, the environment, and the Creator. It also encourages respect, strengthens personal values and convictions, and nurtures faith.

A.D.A.B. is, of course, only one mediating factor between the changing educational landscape brought about by technology and the retention of core traditional moralistic and humanistic values. Many other balancing aspects in the bigger realm of education need to also be evaluated, such as physical space and learning environments, as the new generation prefers quiet, visually designed locations (Shirazian et al. 2025), and the financial implications of being able to truly cater to the needs of Gen Z and beyond. However, as the gap between generations often closes over time, rapid technological advancement may plateau, bringing us closer to a better future for education.

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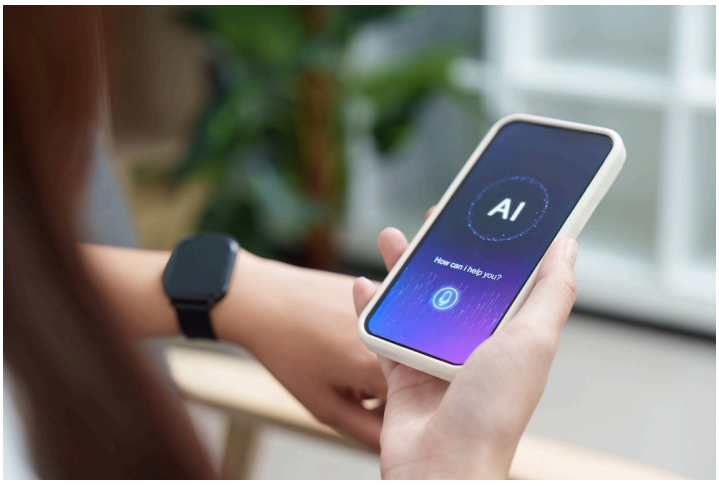
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AI in Education: Breaking Down Barriers to Accessibility

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Learning is no longer confined to classrooms, textbooks, or specific age groups. Today, it is integrated into every aspect of our lives, including work, hobbies, and daily conversations. As technology evolves, artificial intelligence (AI) is becoming one of the most powerful allies for lifelong learning. The recognition of AI across various fields has led to the realization that it can have a transformative effect on education systems. This is important considering that such groups include people with physical disabilities and people who are facing challenges, as well as those who cannot get information from books. AI is changing education in various ways, making it possible for everyone to learn effectively and access education equally, regardless of background or socioeconomic situation.

Artificial intelligence (AI) plays a significant role in advancing multilingual education by reducing language barriers and improving access to learning resources. AI-powered tools, such as translation applications, language-learning platforms, and speech recognition technologies, enable students to access educational content in their native languages. These technologies foster more inclusive learning environments and may encourage greater educational participation among students from diverse linguistic backgrounds (Hillary, 2024).



For example, Duolingo, an AI-supported language-learning platform, provides personalized lessons that adapt to individual learning preferences and progress. This approach improves the accessibility and effectiveness of language education by allowing learners to develop their language skills according to their individual needs (Pedrazzini, 2023).

Beyond language accessibility, AI-based adaptive learning technologies contribute to inclusive education by providing personalized learning experiences that accommodate students with diverse abilities and learning needs. These technologies enable learners, particularly students with disabilities, to access educational materials and progress at their own pace. By adapting learning activities and providing individualized support, AI can help reduce barriers to educational participation and improve student engagement (Gideon, 2023). One example is Microsoft's Seeing AI application, which uses computer vision technology to describe surroundings, read printed text, and identify objects. These features can help students with visual impairments access information and engage more independently in learning activities (Muñoz, 2024).

In education, AI plays an important role in supporting educators by enhancing teaching efficiency and improving the overall learning experience. Rather than replacing teachers, AI-powered tools such as ChatGPT and Gemini can help educators prepare lesson plans, design learning activities, and create quizzes more efficiently. These technologies can also help teachers adapt materials to students' diverse learning abilities and needs, making classroom activities more accessible and engaging. By reducing time spent on routine teaching tasks, AI allows educators to focus more on nurturing creativity, encouraging critical thinking, and building meaningful relationships with students.

By integrating AI technologies with teachers' professional expertise, educational practices can become more effective, interactive, and responsive to students' individual learning needs.

To conclude, AI can greatly improve educational accessibility for all learners, including those with disabilities or other barriers. Through personalized learning experiences, adaptive technologies, and innovative tools, AI helps create a more inclusive and equitable education system. Ultimately, AI aims to help every learner succeed, regardless of their circumstances.



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Helping ESL Learners Find Their Voice in Group Discussions

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In today's interconnected world, speaking English is no longer just an academic requirement; it is a vital tool that helps students share ideas, collaborate across disciplines, and enter the professional world with confidence. Yet, for many English as a Second Language (ESL) learners, knowing the language intellectually does not automatically translate into the confidence to speak it (Horwitz et al., 1986). This internal disconnect becomes glaringly obvious during group discussions. Although collaborative learning aims to foster active dialogue, speaking up among peers often triggers deep anxiety as it is fuelled by the fear of making grammatical errors, facing judgement, or stumbling over complex thoughts (Amoah & Yeboah, 2021). As a result, many capable students choose silence, keeping valuable perspectives to themselves.



This silence, however, does not stem from a lack of awareness of the value of speech. Recent research highlights a frustrating paradox: speaking anxiety remains a major hurdle even for advanced university students who fully recognise how essential group discussions are for their future careers (Amengual-Pizarro, 2018). This contradiction reveals a crucial distinction: knowing that English matters is vastly different from feeling safe enough to use it. A student can thoroughly understand the career benefits of language proficiency and still freeze when asked to share an opinion in class. Therefore, helping ESL learners find their voice requires more than encouraging them to speak; it requires creating conditions that make speaking feel possible and safe.

Recognising this gap points directly to the learning environment's critical role. Because language acquisition is inherently social, it cannot flourish through textbooks and assessments alone; students build genuine competence through meaningful human interaction (Vygotsky, 1978). Research shows that strong peer support correlates with reduced speaking anxiety, increased participation, and improved emotional well-being (Huang, 2023; Ayiz & Tauchid, 2024). Ultimately, speaking anxiety is rarely just a measure of a student's linguistic ability, but it is a reflection of psychological safety. A learner's question shifts from *"Can I speak English?"* to *"Is it safe for me to speak English here?"*

To address this question, educators must change how they approach classroom engagement. Moving beyond simple calls for students to "participate more", teachers need to actively create spaces where

mistakes are welcomed as natural steps in the learning process, not sources of embarrassment. This supportive atmosphere can be practically established through deliberate instructional design:

- **Scaffolded Interaction**: Ease students into discussions by starting with low-stakes pair work before moving to small groups or full class debates (Koyuncu et al., 2024).
- **Processing Time**: Provide a brief preparation period before inviting responses to reduce the pressure to perform immediately (An & Childs, 2023).
- **Culture of Effort**: Offer constructive feedback and celebrate a student's drive to communicate, prioritising clear meaning over perfect grammar (Saputra, 2018).



By implementing these intentional structures, group discussions evolve from assessment tools into substantive platforms for developing practical skills, including negotiating ideas, listening actively, and solving problems collaboratively. This transformation aligns directly with the core vision of Education for a Better Future, which aims to empower students to apply their knowledge beyond the classroom. A brilliant graduate who remains too anxious to speak will naturally struggle in global professional settings.

Building the confidence to bridge this gap is ultimately a shared responsibility. While students must take brave steps outside their comfort zones, educators and peers must cultivate a culture grounded in patience, respect, and mutual growth. When classrooms acknowledge the complexities of language learning, they move beyond passive instruction and become vital platforms for developing confident global citizens.

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Empowering Learners for A Better Tomorrow

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Introduction

Education is a lifelong process through which individuals acquire knowledge, develop practical skills, and cultivate values that prepare them for life. It extends beyond classrooms and academic qualifications, fostering personal growth, critical thinking, creativity, communication, and ethical decision-making. Education enables individuals to understand the world around them, adapt to change, and contribute meaningfully to society (Darling-Hammond et al., 2020).

In today's rapidly changing world, education involves more than simply transferring knowledge from teachers to students. It prepares learners to become adaptable, innovative, lifelong learners who can respond to technological advances and global challenges. Modern education focuses on developing both academic competence and human qualities, such as empathy, collaboration, and resilience (Zhao & Watterston, 2021).

The Impact of Education



Education benefits individuals, communities, and the nation. For individuals, it provides access to improved career opportunities and enhances quality of life. It promotes independence, confidence, and problem-solving skills. Education also instils essential values, including honesty, respect, responsibility, and teamwork. At the societal level, education helps build stronger, more compassionate communities. Educated individuals are more likely to support community development, respect diversity, and collaborate to address social challenges. They are also better equipped to make informed decisions and fulfil their responsibilities as citizens. At the national level, education plays a vital role in promoting economic growth and innovation. A skilled, knowledgeable workforce helps a country remain competitive in a rapidly changing global economy. Education also fosters research, creativity, and the development of new ideas that benefit society.

Education Prepares Learners for the Digital and AI Era

Digital technology and artificial intelligence (AI) are transforming education and the future workplace. Education enables learners to develop digital and information literacy, creativity, and the capacity to use AI responsibly and ethically. Rather than replacing human intelligence, AI should enhance learning, support research, and foster innovation (Holmes et al., 2022). Students who develop technological competence alongside critical thinking and ethical awareness will be better prepared for future careers and lifelong learning.

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Challenges in Education Today



Although education offers many benefits, it also faces several challenges. One of the most significant is keeping up with rapid technological change. Students and teachers need to develop digital skills and use technology effectively to support teaching and learning. Another challenge is unequal access to quality education and digital resources. Not all students have the same access to devices, the internet, or modern learning tools, which can lead to disparities in learning and achievement.

The growing use of artificial intelligence also brings new challenges for us to navigate. While AI can support learning and research, it must be used responsibly. Students must continue to think critically, create original work, and understand the importance of academic integrity and ethical conduct. These challenges highlight the importance of lifelong learning in helping students and teachers adapt to technological changes. Education also fosters creativity, critical thinking, and problem-solving skills, enabling individuals to use emerging technologies, including AI, responsibly and ethically while maintaining academic integrity (Holmes et al., 2022).

Steps Towards a Better Future Through Education

Building a better future through education requires everyone's commitment. First, we should promote lifelong learning, as education should not end at graduation. We should continue acquiring knowledge and developing new skills throughout our lives. Second, schools and universities should strengthen digital literacy and teach students to use artificial intelligence and technology responsibly. This will help learners become more confident and better prepared for the future workplace. Third, education should foster an engaging, student-centred learning environment. Activities such as group discussions, projects, research, and problem-solving encourage students to think creatively and apply their knowledge to real-world situations. Finally, collaboration among educational institutions, families, industries, and communities is essential. Working together enables students to gain practical experience and prepares them for future careers and responsibilities.

Conclusion

Education is essential to building a better future. It enables individuals to develop, strengthens communities, and advances national progress. Although the digital age presents ongoing challenges, education also creates significant opportunities for innovation and lifelong learning. By embracing technology, acquiring new skills, and upholding strong values, we can prepare future generations to thrive in a changing world. Investing in education today helps create a brighter, more inclusive future with opportunities for all. As technology and artificial intelligence continue to reshape the future, education must remain learner-centred and inclusive, with a strong focus on lifelong learning. Investing in high-quality education empowers individuals to become innovative leaders, ethical professionals, and lifelong learners who are prepared to transform their lives and help create a better future for the next generation.

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Read books, defeat the robots!

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Imagine an artificial intelligence (AI) tool generating a 50-page business report, coding a complex software application, or writing a legal contract in under ten seconds. In a world where AI can effortlessly copy technical routines, what keeps a human worker valuable? The secret weapon is not learning another coding language; it is picking up a novel.

Far from an old-fashioned hobby for English majors, university-level literature study acts as a "mental gym". It equips students across disciplines, including engineering, law, and healthcare, with the critical thinking, adaptability, and emotional intelligence they need to succeed in an increasingly challenging, automated future.



Navigating the "Grey Areas" with Sharp Critical Thinking

In basic maths or software code, problems usually have a single, exact answer. Real-world careers are full of messy, unpredictable situations. Literature draws readers into complex scenarios where characters make flawed choices, and sometimes the stories end without neat solutions.

Working through these complex narratives requires students to gather subtle clues, weigh conflicting opinions, and make sense of ambiguity. Research shows that sustained textual analysis pushes students beyond basic comprehension towards advanced inference and critical reasoning (Calma & Davies, 2025). Furthermore, reflective literary engagement yields substantial gains in critical thinking compared with passive learning (Higher Education Studies, 2025). Whether an engineer develops ethical guidelines for self-driving cars or a corporate strategist evaluates sudden market disruptions, reading literature builds the mental agility to solve problems without a simple technical solution (Calma & Davies, 2025; Higher Education Studies, 2025).

Boosting Real-World Careers Across Every Field

Analysing books is not just about appreciation because it directly improves professional performance in non-social science fields. When law, medicine, and business students engage with literature, they develop stronger logic and situational awareness. For instance, a study conducted at a Malaysian public university found that incorporating literature into legal studies significantly elevated students'

analytical reasoning and cultural awareness (Zakaria et al., 2025). Reading between the lines of a novel trains future lawyers to spot hidden details, question assumptions, and evaluate human motives (Zakaria et al., 2025). Similarly, in healthcare and corporate settings, literary training helps professionals look past isolated data points to understand the real human stories behind a patient's illness or a client's needs (Zakaria et al., 2025).

Unlocking Empathy and Deep Self-Awareness

Beyond logic, literature cultivates "cognitive empathy", which is the superpower of stepping into someone else's shoes to understand how they experience the world. At the same time, literary critique strengthens metacognition, which is the ability to monitor and regulate one's own thinking processes (Guamanga, 2025). This double combination allows learners to identify personal cognitive biases, evaluate alternative worldviews, and build the interpersonal empathy necessary for workforce collaboration (Guamanga, 2025). In the tech industry, empathetic developers are far less likely to build unintended cultural or racial biases into algorithms and software interfaces. In corporate leadership, managers grounded in the study of human nature excel at resolving team conflicts, building inclusive teams, and leading with emotional maturity.

Conclusion: The Human Edge in an Automated World

To conclude, while generative technologies can process raw data and generate routine reports at record speeds, they lack ethical depth, cultural intuition, and real human judgement. University literature education bridges this divide by shifting the focus from what to think to how to think. By sharpening critical reasoning, professional adaptability, and empathetic agency, reading literature helps keep human minds irreplaceable, grounded, and innovative in an unpredictable future.

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The Dual Impact of Commercial Songs on Second-Language Acquisition in Malaysia

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Digital media, including streaming platforms, radio broadcasts, and social networks, are the primary channels through which Malaysian youth engage with English and Bahasa Melayu music daily. While formal schooling provides a foundation in grammar and composition, informal media exposure plays an important role in developing practical, real-world fluency. In Malaysia's multicultural society, where bilingual skills can create exciting career opportunities and foster meaningful global connections, listening to popular music offers an enjoyable and accessible way to connect textbook knowledge with natural speech. Nevertheless, relying on popular music for language learning can have both benefits and drawbacks.

On the positive side, commercial music can significantly support natural vocabulary acquisition and the development of oral fluency in target languages. When learners sing along to English or Malay songs, they gain valuable practice with natural speech patterns, connected speech, and prosodic rhythm. This repeated practice helps learners produce speech at a more native-like pace while reducing delays caused by mental translation. In addition, lyrics often contain idiomatic and colloquial expressions that remain memorable long after listening. As Babayev (2025) highlights, engaging with authentic audio media can markedly improve vocabulary retention and help learners understand how words function in real-world contexts. Similarly, Zhang et al. (2023) and Urbaite (2025) emphasize that incorporating diverse musical genres into structured second-language pedagogical frameworks can enhance both pronunciation accuracy and lexical mastery.



Music also plays an important role in cognitive and emotional development, as engagement with songs can enhance intellectual processing while supporting emotional regulation (Bao, 2023). Some Malaysian students may experience speech-related anxiety in bilingual contexts, often because of concerns about performance evaluations and the perceived stigma associated with grammatical errors. Songs provide a comfortable, low-anxiety environment where learners can practise language independently and develop greater confidence. In Malaysia, contemporary popular music often incorporates code-switching, commonly known as Bahasa Rojak, reflecting authentic linguistic dynamics. This fluid blending of languages mirrors real-world communication, helping learners build confidence and affirm their multilingual identities beyond formal educational settings.

Conversely, modern commercial music can present pedagogical challenges that may complicate the development of formal language skills. Popular songs in the target language often prioritize rhythmic

symmetry, rhyme, and artistic expression over strict grammatical accuracy. Lyricists may use nonstandard verb conjugations, fragmented syntax, regional slang, and colloquial dialects rather than standard language registers. When learners transfer these informal structures directly into academic writing or formal presentations, they may unintentionally reinforce grammatical errors or carry inappropriate levels of formality across languages. With thoughtful guidance, however, learners can recognize these features as artistic expression while continuing to develop accurate, context-appropriate language skills.

Furthermore, contemporary audio production often features rapid tempos, intricate rap structures, and digital vocal processing, such as pitch correction, which can alter natural vocal formants. As Vandergrift and Goh (2012) note, fast speech rates and acoustic distortion can make bottom-up auditory processing particularly challenging for second-language listeners. When auditory input is unusually fast or acoustically modified, second-language learners may find it more difficult to segment speech streams into distinct lexical units. Consequently, listeners may misperceive phonemic input and develop inaccurate pronunciations, which may contribute to persistent lexical and semantic errors.

In conclusion, contemporary English and Malay songs can meaningfully influence language acquisition among Malaysian learners. Commercial tracks can help improve auditory processing speed, develop a natural sense of rhythm, and foster emotional engagement, although learners should remain mindful of informal language use. At the same time, nonstandard syntax, colloquial dialects, and the acoustic distortion sometimes found in modern audio production may make formal language acquisition more difficult, particularly when these features are not addressed. Therefore, commercial music is best viewed not as a substitute for rigorous language instruction but as a complementary and highly engaging learning resource. By thoughtfully combining songs that promote communicative fluency with structured materials that support formal grammatical mastery, Malaysian students can develop a deeper understanding of how language works. This balanced approach can help learners build the advanced bilingual proficiency they need to thrive academically and professionally in an interconnected world.

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Rethinking Professional Communication Education for A Better Future

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University life is about more than earning a degree; it's also a valuable time to prepare for the workplace and the realities that come with it. We cannot be certain what the workplace will look like five or ten years from now. With rapid advances in technology, we may not even know what some future jobs will be called. The future is unknown and unpredictable. The only certainty is the importance of interacting with others, expressing thoughts and ideas, and communicating effectively with diverse people to accomplish a common goal. Communication is essential to completing tasks and handling the challenges and problems that arise along the way.

What should universities focus on? Should they prepare students to succeed academically, or should they also prepare them for the challenges they will face after graduation? Preparing students for the communication demands of the workplace is one area where this challenge becomes particularly clear. Preparing presentations, writing memos and letters, and conducting meetings may not be enough to prepare students for real-world communication. As educators, we should pay more attention to the gap between theory and practice in communication education.

A behavioural needs analysis of diploma students in a professional communication course showed that students demonstrated a high level of task completion but had low levels of participation and digital engagement in the classroom (Salim et al., 2025). Several factors may explain this, including students feeling disconnected from the learning process and/or lacking motivation. While it is important to assess whether students are completing assigned tasks, it is also important to assess what they experience while doing so.



This is where blended learning comes in. Learning occurs both inside and outside of the physical classroom. Students can access learning materials and engage in learning activities and tasks outside the physical classroom, including communicating and learning with peers. Students can take greater control of their learning by integrating various information and communication technologies. This is also supported by Mohd Salim et al. (2026), who highlighted the importance of autonomy, competence, and motivation in students' perceived outcomes when using mobile technologies for English language learning. Even when technology is integrated into learning, students still need guidance and opportunities to interact with their peers and engage meaningfully in the learning process.

Research has also shown the value of integrating these elements. For instance, Pinphet and Wasanasomsithi (2022) integrated communication strategy instruction, online tasks, and project work and reported positive impacts on their undergraduate engineering students' oral communication. Shi et al. (2024) also adopted project-based learning to enhance university students' English public speaking.

This approach also creates opportunities for students to learn from one another. Adnan et al. (2024) highlighted the role of informal learning communities among international postgraduate students in Malaysia. They noted that academically related groups, interpersonal contacts, and online groups helped students engage in joint activities and provided opportunities for social interaction and support. Through purposeful activities, students can strengthen their communication skills by interacting, listening to others, and resolving conflicts together.

The focus of the tasks is also important. Mohamed Khalil et al. (2025) used a sales display task to develop their students' English communication skills. They found that the task improved students' confidence and motivation to communicate in English. Choosing an appropriate task helps achieve the goal of integrating communication into language teaching.

Recent innovations also provide new opportunities to integrate diverse aspects of communication into the learning experience. Shah et al. (2024) used 360-degree videos to help students prepare for workplace meetings. Such innovations should not be incorporated merely for novelty; they should support students' classroom communication. Students should practise communication in realistic situations and settings.

Virtual reality (VR) or other innovations can help bring realism to the classroom. They can also expose students to communication situations that are less predictable and not entirely controlled by the instructor. These innovations should support students' learning in realistic settings rather than simply provide instructors with new classroom activities. Students should develop skills in reaching out to others and communicating to resolve issues and conflicts before completing their studies, with the help of teaching innovations.



There is no guarantee that a particular innovation will enable students to learn to rely on others to manage communication or navigate the many uncertainties of the real world. Through a range of realistic learning situations, students should develop the ability to address communication challenges that instructors cannot always anticipate or recreate. The focus, therefore, should be on creating learning situations that reflect the realities and uncertainties of communication beyond the classroom, while integrating teaching, learning, and innovation.

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Building Communication Skills for Future Sports Managers

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Sports management students undertaking placements may be required to explain changes to event plans, brief volunteers and participants, respond to questions, and ensure that updated information reaches the appropriate individuals. Although these situations may appear routine, they require more than an understanding of event management procedures. Students must also communicate effectively with individuals whose roles, expectations, and understanding of the circumstances may vary considerably.

Consider the range of people involved in an event. Volunteers need to know what they are expected to do next, while sponsors may be more concerned with their involvement, the value of their sponsorship, or how a change affects the agreed arrangements. Participants generally require timely information about how a change affects them. Although the information may derive from the same event plan, it cannot always be communicated in the same way. Students must determine what is relevant to a particular audience and how much information that audience needs. In this respect, communication forms an integral part of applying sports management knowledge.

This highlights the interpersonal abilities often described as soft skills. Their relevance to sports management is evident. Managing events and programmes involves working with people, responding to problems, explaining decisions, and addressing differing expectations. For example, Ryder et al. (2024) found that supervisors identified deficiencies in sport management interns' soft skills more often than in their technical skills. This finding raises a practical question for educators: before students enter placements and are expected to manage these situations in real time, to what extent have they had opportunities to practise these skills? Knowing how to prepare an event plan does not necessarily mean that a student can explain it effectively to the people responsible for implementing it. Similarly, preparing a fundraising proposal differs from discussing it with a sponsor who has questions or concerns. Salim et al. (2025) highlighted communication needs related to how students interact, respond, and communicate in professional situations. Students must therefore consider more than what they intend to say. They must also consider who is receiving the information, what that person needs from the interaction, and what may remain unclear afterwards. In some situations, listening carefully to the other person is as important as explaining the original message.



Classroom learning provides an opportunity to practise these skills. Students might prepare a briefing, role-play a workplace interaction, or pitch an event idea to someone acting as a sponsor. Project-based tasks are particularly suitable because students communicate while working towards an outcome, rather than practising communication in isolation. Salim et al. (2026) discussed how project-based tasks can develop communication through collaborative, purposeful activities. A classroom task can also extend beyond a prepared presentation. For instance, a "sponsor" might pose an unexpected question,

requiring the student to listen, respond, and adapt the message. Feedback can then assess whether the explanation was clear, whether the student understood the question, and whether the other person understood what should happen next.

Other classroom approaches offer similar possibilities. Song et al. (2021) demonstrated an interdisciplinary, problem-based learning activity to develop oral communication skills in a sport management course. Beyond the sport management context, Wan Mustapha et al. (2019) also demonstrated that learning activities can extend beyond the conventional language classroom. Taken together, these studies indicate that communication practices are associated with a particular task, situation, or experience rather than being confined to a standalone classroom exercise.

Practice, however, is only one part of the process; feedback is also essential. Lecturers can provide feedback, but peers can play a valuable role as well. A peer's role should extend beyond listening to another student's presentation. If something is unclear, the peer can ask for clarification. If information appears to be missing, the peer can explain what additional information is needed. A question from another student can quickly reveal whether a message that seemed clear to the presenter was equally clear to the listener. Asking questions, seeking clarification, responding, and adapting an explanation are all meaningful forms of participation. They also reflect workplace communication, which rarely follows a prepared script from beginning to end.

This dynamic interaction directly underscores the importance of audience and situational awareness. Mohamed Khalil et al. (2025) found that students valued opportunities to develop ideas about using English in different contexts. Sports management encompasses a range of situations, yet the underlying questions remain consistent: Who am I addressing? What does this person already know? What information does this person need at this point? How should I communicate it? Addressing these considerations



shifts learners' focus from delivering an idealised, rigid presentation to communicating purposefully and in context.

These communicative demands often arise in collaborative environments, such as event planning, creating distinct challenges in assessing individual performance. In a study by Salim et al. (2024), students acknowledged the benefits of group work but expressed concerns about how contributions were allocated. Therefore, the group's overall outcome provides only a partial account of each student's contributions and learning. This issue could be addressed by asking students to prepare individual planning documents, respond to specific questions, and maintain brief reflective entries. These materials would enable the lecturer to gain a clearer understanding of each student's contributions and learning throughout the course.

This same cycle may also apply to work placements. Before a placement begins, students can practise preparing and delivering a briefing for volunteers. During the placement, the supervisor can help students identify what needs to be communicated and recognise when a message should be adapted in response to changes in the environment. After the placement, students can reflect on the interaction by considering the following questions: What did they believe was being communicated? What did they feel was overlooked? If they were to communicate again under similar circumstances, what would they say differently? This form of reflection enables students to integrate classroom learning with the unpredictable nature of workplace communication.

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Bridging Workplace Communication into the Classroom Through AI and 360° Video for Future Graduates

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The world of work is undergoing significant transformation. How people interact and the tools they use to do their work are changing. Numerous innovations will emerge in the workplace, accompanied by diverse ways of working. The skills that will help people thrive in this evolving environment are not new: analysing situations, expressing ideas, collaborating, resolving conflict, and adapting communication to an audience and context are essential for workplace success. People must continually develop and refine these skills to remain relevant in the workplace.

The challenge lies in determining how best to teach and prepare students to become flexible, responsive, and responsible communicators (Salim et al., 2025a). The “how” of professional communication depends heavily on context. Students can learn “what” to communicate in professional contexts. Various initiatives have sought to address this gap by integrating work-based contexts (Salim et al., 2025b). Academic contexts remain the primary environments in which students are socialised to learn the “what” and “how” of communication. There is a need to design professional communication pedagogy and provide students with opportunities to learn communication in contexts that allow them to practise when, why, and how to communicate.

Immersive technologies offer considerable potential. 360-degree videos let students move beyond the confines of the camera frame, look around the space, identify auxiliary communicators and observers, and consider alternative vantage points for viewing the depicted communication. Previous work has incorporated 360-degree videos to create interactive environments that support vocabulary learning (Salim et al., 2025c). Other research has used 360-degree videos to teach students how to communicate and prepare for work-related meetings, thereby improving their communication skills (Shah et al., 2026). 360-degree videos can support the development of communication skills in various ways (Mohd Salim et al., 2026a). A systematic review of 360-degree videos in virtual reality and other simulations for teaching vocabulary and communication skills identified a range of positive effects on student learning. However, the review found that the primary factor limiting these simulations' effectiveness was how much teachers integrated the technology into instruction (Shadiev et al., 2025). 360-degree video can provide context, while AI can facilitate interaction.



Consider a student attending a 360-degree recording of a workplace meeting. A project management issue arose two weeks earlier, and the manager is seeking an explanation from the team. One team member offers an explanation that leads to further disagreement among the team. The student is invited to examine and interpret the situation and share their views on how it should be handled.

The student is encouraged to propose possible solutions and recommend appropriate behaviours. Current technologies can provide immediate feedback based on the student's interpretation. They can also prompt the student to reformulate their response or interpret the situation differently. If team members disagree, the student can be prompted to recommend possible solutions while managing their emotions.

Ultimately, the student can learn how to incorporate feedback and engage in reflective practice. Language-learning practices already incorporate certain elements of observation, interpretation, and feedback. For example, researchers have integrated educational chatbots into virtual language-learning environments (Shah et al., 2025). Researchers have also explored integrating chatbots into English and other language-learning contexts (Mohd Salim et al., 2026b). Furthermore, researchers have incorporated AI-powered technologies into teaching and learning practices to improve speaking and other skills (Meng & Zou, 2026; Wu, 2024).

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