

DATA LITERACY

Developing a Data Literate Workforce

A strategy and framework
for the enterprise

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INTRODUCTION

Strengthen data literacy for a competitive edge

By 2022, revenues from big data and analytics solutions will reach \$274.3 billion¹. Since 1993, we've been helping customers making those investments explore their data. Make connections they never knew existed. Sharpen their competitive edge in an aggressive global economy.

But for many, there's a major stumbling block. Our research shows only 24% of business decision makers, from junior managers to the C-suite, feel fully confident in their ability to read, work with, analyze and communicate with that data — the fundamental skills that define a person's data literacy.

The good news is that the majority (78%) said they would be willing to invest more time and energy into improving their data skillset. But what's the best way to turn that interest into action?

We're committed to creating a data-literate world that can transform business and improve society. As part of that vision, we want to share our six-step approach to developing a dynamic data literacy program across your organization. A program that will give all your people the power to freely explore all your data.

The goal: to transform your businesses in ways that put you in the lead, and help you build loyalty in a workforce energized and empowered by your investment in their professional development.

What is data literacy?

Data literacy is the ability to read, work with, analyze and communicate with data regardless of your role, skill level, or the BI tools you use.

Improving data literacy hones your decision-making skills. You learn to ask the right questions of your data, interpret your findings and take informed action.



¹<https://www.idc.com/getdoc.jsp?containerId=prUS44998419>

²The research was conducted by Censuswide on behalf of Qlik between August 2017 – February 2018. The research surveyed 7,377 business decision-makers (junior managers and above) across Europe, Asia and the U.S. For the full report, visit qlik.com/data-literacy-report.

Where does data literacy start? At the top.

A Chief Data Officer (CDO) is the ideal candidate to lead and advocate for your data literacy initiative. A CDO who is expert in, and enthusiastic about, working with data can inspire the organization to embrace a culture of data literacy. And when it's embedded in the CDO's own mission, potential resistance to a data literacy program is greatly reduced.

If you don't have a CDO, your champion can be the highest-ranking person who understands and believes in the value of data literacy. This may include a VP of Analytics — but could also be a data scientist, business analyst or business user. The key is passion for the mission.

Your champion should enlist at least one member from the C-suite to be an advocate for the data literacy program. Win them over by presenting the power of the program to increase the Return on Investment already made by the company in data initiatives.

Building data literacy increases the ranks of those looking for opportunities to improve business. The goal of a data literacy program is to improve everyone's ability (and motivation) to read, work with, analyze and communicate with data — not just data scientists. The more people who are data-literate, the more impact your business will see: real business changes that lead to real business results.

What is a Chief Data Officer?

“...the chief data officer oversees a range of data-related functions that may include data management, ensuring data quality and creating data strategy. He or she may also be responsible for data analytics and business intelligence, the process of drawing valuable insights from data...”

NewVantage Partners' Big Data Executive Survey 2018 found that 62.5 percent of senior Fortune 1000 business and technology decision-makers said their organization had appointed a chief data officer.

Source: Zetlin, Minda, [*“What is a chief data officer? A leader who creates business value from data.”*](#) CIO, May 28, 2019

Six steps to a best practices data literacy program

Regardless of the size or focus of your business, you can develop a data literacy program by following the steps illustrated in Figure 1. Let's discuss them in the order you would follow when first establishing the program. Longer term, you will repeat the cycle to grow the program across the organization.

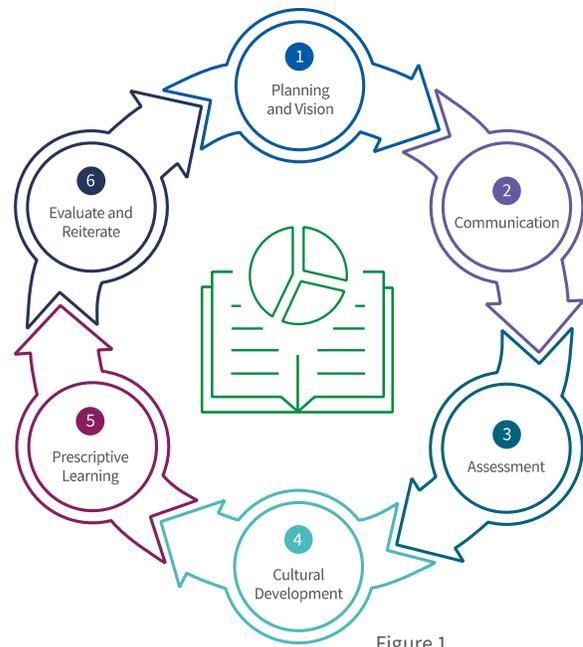


Figure 1

STEP 1



Planning and Vision

Putting in place a strong data literacy program starts with a formal discussion between people charged with leading data initiatives and strategies in your organization.

The agenda should define three critical aspects of the program.

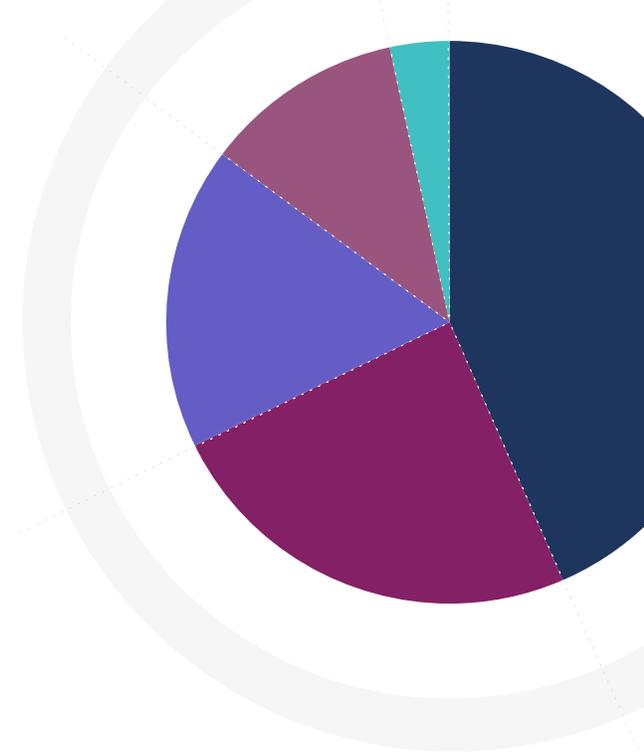
Participants: The size of your organization will help determine who should take part in the initial data literacy program. If you're a smaller business, your entire organization may take part. For larger businesses, targeting specific individuals, teams, or departments may be a more useful strategy.

Make sure that initial participants already play a role in data-driven decisions and are good communicators. Their enthusiasm in working with data will help advance the data literacy program as you bring on additional groups.

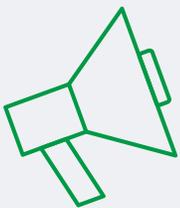
Funding: Get your funding approved from the top. You can lobby to include the program in the budget for business intelligence, change management or other data initiatives. Alternatively, propose a separate budget dedicated to establishing and supporting the data literacy program.

Adopting our six-step approach can help you stay within budget by eliminating false starts and missteps that can drive up costs. Look for cost saving techniques like those described in the section on "Getting started with data literacy". For example, use online modules for building data literacy, available at no charge.

Timeframe: Set a target date for having your data literacy program defined and in place. As a guideline, we have typically found the first three of our recommended steps can be completed within three months (discussion, communication and assessment). The remaining steps (cultural learning, prescriptive learning and measurement) can begin the month following assessment. Your best bet for rapid adoption of the program is to allow participants to build their skills within their work day. You'll be far more successful adjusting their workloads than expecting them to devote non-work hours to skill-building.

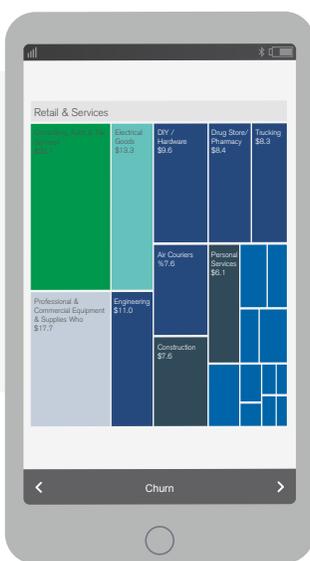


STEP 2



Communication

Get off on the right foot by preventing miscommunication and rumor. Craft a thoughtful communication plan that lets people know from the start why you are putting a data literacy program in place. Don't lead with the more detailed how and what of the program. Present the benefits to participants themselves. Data literacy will bring the excitement of discovery and more empowerment to the job they do now — but it will also advance their careers through professional development.



Be transparent about the program from the very beginning. Assure everyone that benefits will extend across the organization as the program rolls out — not just to initial participants. Make it clear that leadership is solidly behind the program because of its importance to the overall success of the business.

Once people are familiar with why a data literacy program is being put in place, you can share the details of the program through your organization's established communication channels. Celebrate the program's progress so the entire organization is aware of how participants' jobs are more exciting. Make it clear that the data literacy program is not a one-time hit but a dynamic part of the organization's growth.

STEP 3



Assessment

If you are the leader of a team participating in the program, don't rely on preconceptions or assumptions about team members' current comfort level with data literacy.

Introduce participants to this [online self-service tool](#). It is accessible 24/7 at no cost.

The responses to this assessment will describe their comfort level in terms of four data personas reflecting different levels of data literacy: Data Guru, Data Apprentice, Data Newcomer and Data Avoider. These personas are described in greater depth in the section below on "Assessment: Introducing data literacy personas."

For each persona, there is a prescriptive learning roadmap an individual can follow, with immediate benefits in helping them do their current job more effectively—and prepare for the next step in their career.

Teams and individuals should take this assessment in the first 90 days of initiating the data literacy program. Anyone in the organization with interest in data literacy can take it, not only those actively participating in the data literacy program. It's a great way to promote wider awareness of the program.

Take the assessment

[Click here](#) to launch our online self-service assessment to find out which persona maps best to your current level of data literacy. There is no cost to take the assessment. We believe in the power of data to transform business and improve society.

STEP 4



Cultural Development

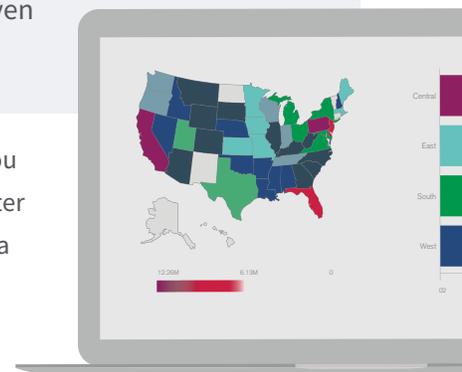
Establishing a data literacy program should be approached like other forms of change management, not as an overwhelming sea change to the way your business works.

Improving data literacy takes place through cultural learning, woven into the existing culture over time as it proves its value.

Your data literacy program will directly affect cultural learning in those participating. But you can spread the learning outside the program by something as simple as promoting the greater use of data in meetings. Point to examples of current decision-making processes where data use is a requirement. Show that cultural learning has already begun in your organization.

These resources can help your campaign:

- Online Module: [A Culture of Data Literacy](#)
- Qlik® Instructor-Led Learning
- Book: ["Data Fluency: Empowering your Organization with Effective Data Communication"](#)



STEP 5



Prescriptive Learning

The prescriptive learning roadmaps presented later in this document aren't rigid lesson plans. Informed by hundreds of engagements with customers, roadmaps offer a "buffet" of resources from which each person can choose according to their learning style and the time they have available in their day.

Designed according to the needs of Data Guru, Data Apprentice, Data Newcomer and Data Avider, roadmaps help ensure that no learner feels lost trying to absorb a concept for which they have not been prepared. Or bored by wasting time on skills they have already mastered.

It's worth repeating that the success of a data literacy program depends largely on incorporating learning time consistently in daily schedules, whether it's one or four hours a week. Learners need to know that the organization believes data literacy is important in the execution of their job.

Learning, not training

Try not to use the word "training" in communicating about a data literacy program. The word can suggest yet another drain on getting daily work done. Instead, promote the direct benefits of learning about data literacy – why it can improve the way they work and advance them professionally.

STEP 6



Evaluate and Reiterate

The initial discussion of a data literacy program should define the kinds of metrics that will be used to evaluate the program and justify its extension with positive trends, data usage, number of courses completed, certifications awarded, etc.

Decide how frequently progress should be measured and make sure positive results are widely celebrated. When trends are not favorable, turn disappointments into stepping stones for improvement by quickly holding a "post mortem" that identifies what went wrong (and what went right).

Keep cycling through the steps

As teams cycle through your data literacy program, continue to repeat the six steps we have presented. Each iteration should improve and extend your data literacy program so that both individuals and the organization benefit. Consider building an introduction to data literacy into your new hire on-boarding, so cultural learning starts from day one.

Refresh discussions on data literacy every 6-12 months, celebrating successes of your program but also incorporating innovations that may build more value into the program, like gamification, and ensure a positive feedback loop.

Above all, maintain transparent communications on the data literacy program. Stay current with new developments in technology and techniques as more organizations learn to lead with data. As cultural learning in data literacy deepens and spreads across the organization, watch your competitive edge sharpen and enjoy a workforce that's energized, empowered — and loyal.



Assessment: Introducing data literacy personas

In step 3, we discussed the importance of determining the initial comfort level of each program participant with data and data literacy.

In our experience, people typically fall into one of four types of data literacy personas — from the most highly skilled Data Guru to the least trained, even skeptical, Data Avoider. Data Apprentice and Data Newcomers falling between them.

Take the assessment

[Click here](#) to launch our online self-service assessment to find out which persona maps best to your current level of data literacy.

DATA LITERACY PERSONAS



Data Guru: The most data literate employees have advanced skillsets and experience in data analytics — some may even be data scientists. Support their continued learning in storytelling, algorithms and the latest methodologies for data analytics. Help Data Gurus develop skills in leadership and mentoring, so they can serve as evangelists and mentor others in helping your organization lead with data.



Data Apprentice: Driven to become more data literate, Data Apprentices are eager to further their skills in data science, algorithms and statistical analysis. With an eye to progressing to Data Guru, Data Apprentices are also looking to further their leadership, mentoring and overall business skills. Enhance their storytelling skills to demonstrate the power of data literacy.



Data Newcomer: Data Newcomers are still in the beginning stages of data literacy, having recognized the benefits of working with data in their current roles. They need foundational learning in data and analysis as well as critical and analytical thinking. They can then build on this foundation with skills in advanced analytical concepts, visualization and storytelling.



Data Avoider: Data Avoiders are often skeptical of the value of data-driven decisions and processes. They need to see the benefits of using data to validate intuition and tribal knowledge on which they typically rely. Awareness training is pre-requisite to overcoming barriers to change. Avoiders need to understand they can leverage their existing strengths as they begin foundational work in data literacy. It is part of their role, not a burdensome add-on. Attention to this persona is critical to preventing roadblocks that can derail the successful roll-out of a data literacy program.

Each of these personas has a different set of requirements to smoothly advance their data literacy learning and empowerment. In the next section, we present individualized roadmaps for skill building with a roadmap of resources for developing data literacy in each persona to its full potential.

Roadmaps for data literacy learning and empowerment

The charts in this section map the appropriate learning resources to key target skillsets for each persona in developing a higher level of data literacy.



Learning resources for **Data Guru**

How to READ data	
Week 1	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Why Analytics • Data Literacy Culture
Week 2	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Decision Making Framework • Data Informed Decision Making Framework • Decision Making Analytic Techniques
How to WORK WITH data	
Week 3	Data Skeptic: Short, burst episodes <ul style="list-style-type: none"> • Experimental Design • Bayesian Updating • Sample Sizes
Week 4	Analytics on Fire Podcast: <ul style="list-style-type: none"> • How to be Data-Informed, NOT Data-Driven • Why the Key to a Data-Driven Culture is Community
How to ANALYZE data	
Week 5	Data Skeptic: Short, burst episodes <ul style="list-style-type: none"> • Selection Bias • Noise • Cross Validation
Week 6	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Correlation and Causation • Understanding Signal and Noise
How to COMMUNICATE WITH data	
Week 7	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Data Storytelling • Decision Tree Analysis
Week 8	<ul style="list-style-type: none"> • TED Talk – Andrew Stanton: The Clues to a Great Story • TED Talk – Suzanne Duncan: The Dark Side of Storytelling

Supplemental Reading

Qlik Blog:

- Essential Steps to Making Better Data Informed Decisions
- Unlocking the 3 Doors to Great Decisions
- The Power of Inclusion
- Insights vs Observations
- Do you speak a Second Language
- Speed Does Matter
- Data Literacy: The Key to Adoption
- Data Literacy – Start at the Top
- Ask the Right Questions
- Looking to be Data Literate? Begin with Curiosity
- A Culture of Data Literacy

Books:

- Naked Statistics by Charles Wheelan
- Factfulness by Hans Rosling
- The Signal and the Noise by Nate Silver
- Data Story by Nancy Duarte



Learning resources for **Data Apprentice**

How to READ data	
Week 1	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Why Analytics • Data Literacy Culture
Week 2	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Decision Making Framework • Data Informed Decision Making Framework • Decision Making Analytic Techniques
How to WORK WITH data	
Week 3	<ul style="list-style-type: none"> • YouTube – Decision Intelligence by Cassie Kozyrkov • Data Skeptic: Short, burst episodes <ul style="list-style-type: none"> - The Central Limit Theorem - Structured and Unstructured Data
Week 4	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Understand Data • Understand Aggregations • Understand Distributions
How to ANALYZE data	
Week 5	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Hypothesis Testing • Confidence Intervals
Week 6	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Correlation and Causation • Understanding Signal and Noise
How to COMMUNICATE WITH data	
Week 7	<ul style="list-style-type: none"> • Qlik Continuous Classroom: Data Storytelling • TED Talk – Andrew Stanton: The Clues to a Great Story
Week 8	Analytics on Fire Podcast: <ul style="list-style-type: none"> • How to be Data-Informed, NOT Data-Driven • Why the Key to a Data-Driven Culture is Community

Supplemental Reading

Qlik Blog:

- Essential Steps to Making Better Data Informed Decisions
- Unlocking the 3 Doors to Great Decisions
- The Power of Inclusion
- Insights vs Observations
- Do you speak a Second Language
- Speed Does Matter
- Data Literacy: The Key to Adoption
- Data Literacy – Start at the Top
- Ask the Right Questions
- Looking to be Data Literate? Begin with Curiosity
- A Culture of Data Literacy

Books:

- Naked Statistics by Charles Wheelan
- Factfulness by Hans Rosling
- The Signal and the Noise by Nate Silver
- Data Story by Nancy Duarte



Learning resources for **Data Newcomer**

How to READ data

Week 1	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Why Analytics • Data Literacy Culture
Week 2	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Decision Making Framework • Data Informed Decision Making Framework • Decision Making Analytic Techniques

How to WORK WITH data

Week 3	<ul style="list-style-type: none"> • YouTube – Decision Intelligence by Cassie Kozyrkov • Data Skeptic: Short, burst episodes <ul style="list-style-type: none"> - Noise!! - Selection Bias
Week 4	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Understand Data • Understand Aggregations • Understand Distributions

How to ANALYZE data

Week 5	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Hypothesis Testing • Confidence Intervals
Week 6	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Correlation and Causation • Understanding Signal and Noise

How to COMMUNICATE WITH data

Week 7	<ul style="list-style-type: none"> • Qlik Continuous Classroom: Data Storytelling • TED Talk – Andrew Stanton: The Clues to a Great Story
Week 8	Analytics on Fire Podcast: <ul style="list-style-type: none"> • How to be Data-Informed, NOT Data-Driven • Why the Key to a Data-Driven Culture is Community

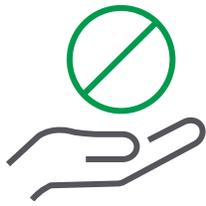
Supplemental Reading

Qlik Blog:

- Essential Steps to Making Better Data Informed Decisions
- Unlocking the 3 Doors to Great Decisions
- The Power of Inclusion
- Insights vs Observations
- Do you speak a Second Language
- Speed Does Matter
- Data Literacy: The Key to Adoption
- Data Literacy – Start at the Top
- Ask the Right Questions
- Looking to be Data Literate? Begin with Curiosity
- A Culture of Data Literacy

Books:

- Naked Statistics by Charles Wheelan
- Factfulness by Hans Rosling
- The Signal and the Noise by Nate Silver
- Data Story by Nancy Duarte



Learning resources for **Data Avider**

How to READ data

Week 1	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Why Analytics • Data Literacy Culture
Week 2	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Decision Making Framework • Data Informed Decision Making Framework • Decision Making Analytic Techniques

How to WORK WITH data

Week 3	<ul style="list-style-type: none"> • TEDx Talk – Jordan Morrow: Why Everyone Should Be Data Literate
Week 4	Qlik Continuous Classroom: <ul style="list-style-type: none"> • Understand Data • Understand Aggregations • Understand Distributions

How to ANALYZE data

Week 5	<ul style="list-style-type: none"> • Data Skeptic: Short, burst episodes <ul style="list-style-type: none"> - Noise!! • Analytics on Fire Podcast: <ul style="list-style-type: none"> - How to be Data-Informed, NOT Data-Driven - Why the Key to a Data-Driven Culture is Community
Week 6	<ul style="list-style-type: none"> • TED Talk – Andrew Stanton: The Clues to a Great Story • Qlik Continuous Classroom: Data Storytelling

How to COMMUNICATE WITH data

Week 7	Analytics on Fire Podcast: <ul style="list-style-type: none"> • The Truthful and Functional Art – How to Visualize your Data with Alberto Cairo
Week 8	Analytics on Fire Podcast: <ul style="list-style-type: none"> • Common Big Data Myths That Most BI People Believe, Debunked with Andrew Brust of Datameer

Supplemental Reading

Qlik Blog:

- Essential Steps to Making Better Data Informed Decisions
- Unlocking the 3 Doors to Great Decisions
- The Power of Inclusion
- Insights vs Observations
- Do you speak a Second Language
- Speed Does Matter
- Data Literacy: The Key to Adoption
- Data Literacy – Start at the Top
- Ask the Right Questions
- Looking to be Data Literate? Begin with Curiosity
- A Culture of Data Literacy

Books:

- Naked Statistics by Charles Wheelan
- Factfulness by Hans Rosling
- The Signal and the Noise by Nate Silver
- Data Story by Nancy Duarte

Getting started with data literacy

At Qlik, we believe in the power of data to transform business and improve society. We have designed a program that helps raise the level of data literacy in any organization that wants to lead with data.

You do not need to be a Qlik customer to benefit from this program, nor do you need to purchase any products from Qlik. Many of our program offerings are provided without charge.

The learning we provide is product agnostic. It's built around widely adopted data, analytics and statistical concepts that can be used in any context and with any BI tool.

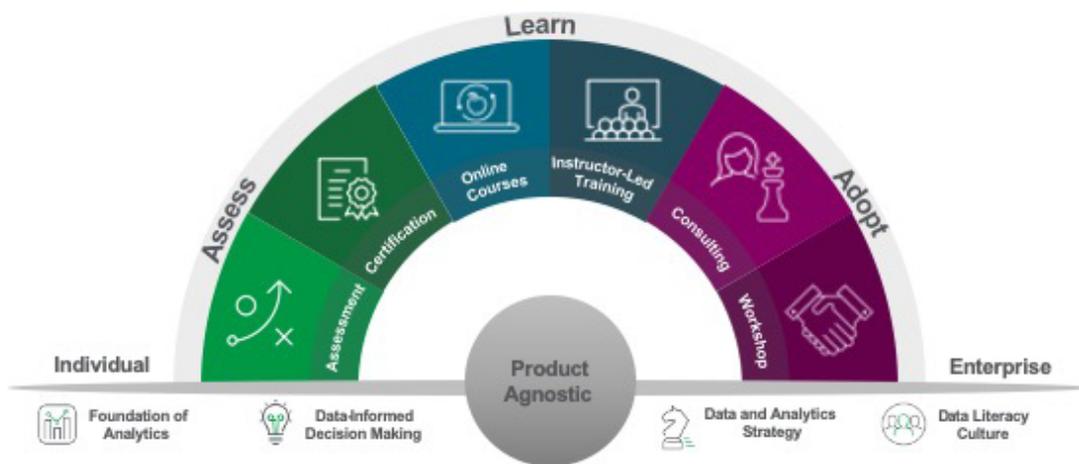
Our program is designed to empower everyone with the ability to confidently understand, analyze and use data, whether their work is in business, attend school or work in a non-profit organization.

Preparing students to enter today's workforce?

A recent study showed that a mere 21% of 16-24-year-olds are data literate.

The Qlik Academic Program provides students, professors and researchers at both nonprofit and non-for-profit accredited universities with free Qlik software and learning resources, including resources on data analytics and data literacy. It also includes free access to the Qlik Continuous Classroom.

For more information visit qlik.com/dataliteracy or contact us at dataliteracy@qlik.com



About Qlik

Qlik's vision is a data-literate world, where everyone can use data and analytics to improve decision-making and solve their most challenging problems. Our cloud-based Qlik Active Intelligence Platform delivers end-to-end, real-time data integration and analytics cloud solutions to close the gaps between data, insights and action. By transforming data into Active Intelligence, businesses can drive better decisions, improve revenue and profitability, and optimize customer relationships.

qlik.com